# MONTHLY WEATHER REVIEW

OCTOBER, 1932

# CONTENTS

Tropical Disturbance of September 7–15, 1932. R. H. Weightman Bibliography Solar Observations Aerological Observations Rivers and Floods Weather on the Atlantic and Pacific Oceans	WEATHER CHARTS OF THE NORTHERN HEMISPHERE.	Note.
Solar Observations Aerological Observations Rivers and Floods	TROPICAL DISTURBANCE OF SEPTEMBER 7-15, 1982.	R. H. Weightman
Solar Observations Aerological Observations Rivers and Floods	BIBLEOGRAPHY	
RIVERS AND FLOODS		
	AEROLOGICAL OBSERVATIONS	
Washington of the Art Course Are Course Occasion	RIVERS AND FLOODS	
WEATERS ON THE ATLANTIC AND LACUIC UCEANS	WRATER ON THE ATLANTIC AND PACIFIC OCEANS	
	CHARGE L.VI. (Chart VII. MONRY SNOWING CONTRACT	



UNITED STATES DEPARTMENT OF AGRICULTURE
WEATHER BUREAU

WASHINGTON, D. C.



# MONTHLY WEATHER REVIEW

Editor, W. J. HUMPHREYS

Vol. 60, No. 10 W. B. No. 1088

OCTOBER, 1932

CLOSED DECEMBER 3, 1932 ISSUED January, 6, 1933

# BISHOP'S RING SEEN IN AUSTRALIA FOLLOWING THE EXPLOSION OF QUIZAPÚ, CHILE, APRIL 10, 1932

Mr. Albert G. Ingalls, associate editor of the Scientific American, kindly sent to me the following letter by Mr. Frazer-Paterson, of Broken Hill, Australia:

I beg to advise that the Bishop's ring was visible in the western sky at 5 p. m. on Saturday the 23d July, 1932. This date is about 10½ weeks after the eruption in the Andes. The color of the ring was sepia.

Bishop's ring, so named after the Rev. Sereno Bishop, of Honolulu, Hawaii, who was the first to describe it as seen after the explosion of Krakatoa in 1883, is a broad, diffuse corona of about 22° outer radius. It is produced by diffraction of the sun's light by fine volcanic dust in

the stratosphere and is analogous to the small rings in thin clouds about the sun and moon.

This appearance in Australia of Bishop's ring is only one of several phenomena of the same origin reported from many parts of the Southern Hemisphere since the explosion of Quizapú, latitude 35° 38′ S., the evening of April 10, 1932. Of course the intensity of the sunshine at the surface of the earth has been reduced over much of that hemisphere, and it will be interesting to know the consequent effect on the average temperature. There is no evidence yet that this dust has spread to the Northern Hemisphere.—Editor.

#### WEATHER CHARTS OF THE NORTHERN HEMISPHERE

It is a matter of great interest to meteorologists and climatologists that the Deutsche Seewarte of Hamburg has undertaken to produce, on behalf of the International Meteorological Organization, daily synoptic weather charts based on as full information as can be obtained. These charts are not prepared in time for current forecasts, but are for that detailed study out of which more

may be learned of the causes of spells of abnormal weather, and thus greater accuracy, and especially greater range, in weather forecasting be secured.

The Deutsche Seewarte, which needs and merits support in this undertaking, will gladly furnish further information and a sample map to anyone especially interested in this work.—Editor.

# TROPICAL DISTURBANCE OF OCTOBER 7 TO 15, 1932

By R. H. WEIGHTMAN

[Weather Bureau, Washington, D. C.]

A disturbed condition made its appearance over the western Caribbean on the 7th between Swan Island and Cape Gracias and during the next two days moved slightly north of west, with slowly decreasing pressure at the center. It was central on the evening of the 9th a short distance east of Belize, with lowest pressure 29.56 inches. It continued to move slowly westward until the 11th, when it was central near Carmen (Mexico). (See Track No. 10 on Chart VIII at end of this Review.) It then turned more to the northwestward, and on the 14th, 8 a. m., it was located about 200 miles southeast of Brownsville. Storm warnings were hoisted between Brownsville and Corpus Christi following the receipt of 4 p. m. special observations from these stations. Brownsville reported winds shifting from the north to northeast

and a fall in barometric pressure of 0.14 inch in three hours. By 8 p. m. of the 14th, however, the winds at Brownsville had backed to northwest, which with other available information placed the center about 150 miles east by south of Brownsville. During the next 12 hours the disturbance advanced northeastward and on the morning of the 15th was located about 120 miles southeast of Galveston. At that time storm warnings were ordered between Galveston and New Orleans and a little later between New Orleans and Apalachicola. The disturbance moved inland across the Louisiana coast during the afternoon of the 15th. While attended by gales no winds of hurriance force were reported at any time during its history.

## BIBLIOGRAPHY

C. FITZHUGH TALMAN, in charge of library

#### RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Baldit, Albert,

Orages, grêle et foudre dans la Haute-Loire. Le Puy-en-Velay. 1932. 224 p. illus. 25½ cm. (Pub. Soc. des études locales. No. 11.)

Brooks, C. E. P.

Le climat du Sahara et de l'Arabie. Paris. 1932. 81 p. figs. 27 cm. (Soc. de géogr., Paris. Le Sahara, ouvr. pub. sous la direc. de Masauji Hachisuka.) tt, T. C.

Elliott, T. C.
Chinook wind. Salem. 1932. 7 p. 24 cm. (Repr.: Oregon hist. quart. v. 33, no. 3.)

Ficker, H. v.
Über die Entstehung lokaler Wärmegewitter. 2. Mitteilung.
Die Vorgänge in der freien Atmosphäre über Lindenberg am
2. und 3. Juli 1914. Berlin. 1932. 54 p. figs. 25½
cm. (Sitzungsber. preuss. Akad. der Wissensch. Phys.math. Kl. 1932. XVI.)

Gray, R. Whytlaw, & Patterson, H. S.
Smoke, a study of aerial disperse systems. London. 1932.
viii, 192 p. figs. pl. 22½ cm.

Great Britain. Min. agr. & fish., & bd. of agric. for Scotland. Agric.
met. scheme.

met. scheme.

Bibliography of literature on agricultural meteorology. Sec. 1-4. (in 3 vols.) 1930. [Manifolded.]

International geodetic and geophysical union. Association of meteor-

ology.
Réunion de Lisbonne (Octobre 1933). Programme de discussion. Paris. 1932. 3 p. 27 cm.

Jaumotte, J.

Jaumotte, J.

La compensation thermique des baromètres anéroïdes.

Bruxelles. 1932. 26 p. figs. 25 cm. (Inst. roy. mét. de Belgique. Mém. v. 4.)

Kinoshita, Masao, & Ishii, Chihiro.

Effect of humidity on supersonic velocity in air. p. 83-96. illus. 26½ cm. (Sci. papers Inst. phys. & chem. res., v. 19, Oct. 1, 1932.)

Lucio R

Lucio, R.

Las perturbaciones de la atmósfera. Mexico. 1932. 109 p. 17 cm.

Mémery, Henri.

Les époques de fréquence de la pluie, à Bordeaux, pendant 50 ans (1880 à 1929). Bordeaux. 1931. p. 125-128. 24 cm. (Assoc. franç. avance. sci. Extr. Comptes-rendus, Congrès d'Alger (Avril 1930).

L'Influence solaire et les progrès de la météorologie. Résultats de 50 années d'observations solaires et météorologiques comprenant les observations et les recherches effectuées à Talence, a partir de 1900. Talence. 1932. 23 p. figs. 24½ cm.

Schmidt, Karl.

Die Abkühlungsgrösse in Karlsruhe. Karlsruhe. 1932. 28

Schmidt, Karl.

Die Abkühlungsgrösse in Karlsruhe. Karlsruhe. 1932. 32
p. illus. 28 cm. (Veröffent. Badischen Landeswetterwarte. Nr. 18.)

Talman, Charles Fitzhugh.

Magic called mirage. v. p. illus. 30 cm. (Yachting. v. 51, no. 4, Apr., 1932.)

# SOLAR RADIATIONS

# SOLAR RADIATION MEASUREMENTS DURING OCTOBER, Table 1.—Solar radiation intensities during October, 1932—Contd.

By IRVING F. HAND, Assistant in Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January, 1932, REVIEW, page 26.

Table 1 shows that solar radiation intensities averaged slightly above normal values for October at all three stations at which normal incidence measurements are made.

Table 2 shows an excess in the total solar radiation received on a horizontal surface at Lincoln, Chicago, Fresno, Pittsburgh, and Miami, and a deficiency at all other pyrheliometric stations.

Table 3 shows low turbidity values for the month with the exception of October 3, which was an extremely

hazy day.

Polarization measurements obtained on four days at Washington give a mean of 60 per cent, with a maximum of 64 per cent on the 29th. At Madison measurements obtained on four days give a mean of 58 per cent, with a maximum of 60 per cent on the 21st. These are average October values for Washington, but for Madison the values are considerably below the October normals.

Table 1.—Solar radiation intensities during October, 1932 [Gram-calories per minute per square centimeter of normal surface] Washington, D. C.

				8	un's z	enith d	listanc	18			
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.00	60.0°	70.7°	75.7°	78.7°	Noon
Date	75th				A	ir mas	58				Local
·	mer. time		A.	M.				P	. M.		solar time
	е.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
Oct. 3	mm. 10, 21 7, 04	cal.	cal.	cal.	cal.	cal. 1.33 1,39		cal.	cal.	cal.	mm. 11. 38
Oct. 10 Extrapolated	9.14	0.70	0.07	1.00	0.77	1, 09					10.97

#### Washington, D. C .- Continued

				8	Bun's z	enith d	listano	Э			
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noor
Date	75th mer.				A	ir mas	38				Loca
	time		A.	M.				P	. м.		time
	е.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
Oct. 11	mm, 6.50	cal.	cal.	cal.	cal. 1.30		cal.	cal.	cal.	cal.	mm.
Oct. 14 Oct. 22 Oct. 27 Oct. 29	5. 36 6. 27 7. 29 6. 02	0.67		0.99 1.04 1.03	1.23	1. 47 1. 53 1. 45					4. 5 4. 5 4. 7 3. 6
Means Departures		0.75	0. 88 +0. 04		1. 17	1. 43 +0. 02	(1. 28) +0. 16				

#### Madison, Wis.

Oct. 6	3, 99		1.04	1. 31			 4, 17
Oct. 7 Oct. 13	5. 16 4. 75	 0.94	1.08		 1, 29	 	 6. 27 4. 17
Oct. 20	3. 81 3. 81	 1, 29		1. 46	 1. 38 1. 36	 	 4. 17 3. 81
Oct. 26 Means	4.75	 (1, 12)	1. 14		 1.30		 4. 17
Departures				+0.10	 +0.14	 	 

#### Lincoln, Nebr.

Oct. 1	9.47		0.91	1. 17	1, 22	1. 36					10.59
Oct. 11	4. 57			0,75							3, 99
Oct. 12	6. 02						1, 27	1, 11	0.97	0.81	6. 27
Oct. 13	6. 27				1, 10		1, 31	1.04			7.57
Oct. 17	6. 27										8, 18
Oct. 18	10. 59				1.03						10.97
Oct. 19	4. 37						1, 40				3, 45
Oct. 20	3. 45	1.09	1.31	1. 38	1.46		1.40				3, 45
Means		0.88	1.04	1. 13	1. 26	1, 46	1. 34	(1.08)	(0.97)	(0.81)	
Departures		+0.02	+0.10	+0.03	-0.02	-0.02					

Table 2.—Average daily totals of solar radiation (direct+diffuse) received on a horizontal surface

					Gr	am calorie	s per squa	re centimet	er				
Week beginning—	Washing- ton	Madison	Lincoln	Chicago	New York	Fresno	Pitts- burgh	Fair- banks	Twin Falls	La Jolla	Gaines- ville	Miami	New Orleans
t. 1 1932 t. 8	cal. 326 363 194 225	cal. 267 194 189 139	cal. 328 322 369 198	cal. 268 180 239 156	cal. 280 312 98 154	cal. 454 420 411 400	cal. 283 237 123 230	cal. 112 95 58 43	cal. 371 311 280 276	cal. 172 196 227 285	cal. 209 290 183 185	cal. 422 365 385 416	ent. 312 370 346 356
					П	Departures	from wee	kly normals	3				
et. 1	-3 +57 -83 -43	-2 -48 -34 -63	+4 +22 +62 -74	+45 -16 +58 -6	+16 +69 -112 -35	+56 +32 +36 +54	+23 +23 -67 +52		-27 -25 -80 -45	-130 -80 -30 +18	-144 -68 -177 -168	-21 -38 +2 +59	
					Ac	ecumulated	departur	es on Oct. 2	8				
	+8,638	+961	-1,419	+16,865	+19, 364	+9,356	+6, 370		-8,696	-2,028		-3, 369	

Table 3.—Solar radiation measurements, and determinations of atmospheric turbidity factor (β), Washington, D. C., October,

Date and solar hour angle	Solar alti- tude, h.	Air mass, m.	Ι.	I,	Ir	β	Blue- ness of sky	Atmospheric dust particles per cubic centimeter	Notes: sky- light polari- zation, P.; clouds, etc.
Oct. 3 0:27 a 0:24 a	46-36 46-41	1. 38 1. 37	gr. cal. 1. 231 1. 245	gr. cal. 0.873 0.878	gr. cal. 0. 690 0. 694	0. 120 0. 115	5	529	Hazy. Cirri.
Oct. 8 4:34 a	12-36 13-21 20-42 21-04 26-20 26-52	4.50 4.26 2.81 2.76 2.25 2.21	0. 809 0. 837 1. 028 1. 030 1. 058 1. 127	0. 618 0. 621 0. 734 0. 740 0. 827 0. 830	0. 525 0. 528 0. 618 0. 622 0. 660 0. 663	0. 065 0. 065 0. 065 0. 070 0. 075 0. 075	5	674	P=58.0.
Oct. 11 3:03 a 3:00 a	27-29 27-53	2.09 2.07	1. 283 1. 289	0. 929 0. 931	0,737 0,740	0. 060 0. 060		355	
Oct. 14 3:46 a	19-34 20-17 37-40 37-56 42-31 42-36	2.96 2.86 1.63 1.62 1.48 1.48	1. 106 1. 100 1. 306 1. 284 1. 333 1. 332	0.842 0.846 0.930 0.934 0.912 0.916	0. 672 0. 675 0. 742 0. 743 0. 735 0. 737	0, 060 0, 065 0, 080 0, 085 0, 080 0, 080	6	528	P=61.9.
Oct. 22 3:48 a	17-07 17-37 23-22 28-16 28-41 39-49 39-52	3.37 3.28 2.52 2.11 2.08 1.56 1.56	1. 025 1. 034 1. 100 1. 248 1. 242 1. 369 1. 348	0. 778 0. 781 0. 809 0. 872 0. 875 0. 822 0. 825	0,606 0.609 0.657 0.703 0.714 0.720 0.722	0. 045 0. 045 0. 050 0. 050 0. 060 0. 045 0. 050	5	420	P=57.0.
Oct. 27 0:25 a 0:21 a	37-54 37-58	1. 63 1. 62	1. 254 1. 310	0.905 0.908	0. 703 0. 705	0. 080 0. 060		420	
Oct. 29 2:17 a	28-40 37-14 37-31 37-34	2.08 1.65 1.64 1.64	1. 246 1. 334 1. 311 1. 328	0.925 0.960 0.963 0.963	0.728 0.749 0.746 0.746	0. 065 0. 065 0. 075 0. 070	4		P=64.3.

# POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, Yerkes, Perkins, and Mount Wilson observatories. The differences of longitude are measured from central meridian, positive west. The north latitudes are plus. Areas are corrected for foreshortening and are expressed in millionths of sun's visible hemisphere. The total area, including spots and groups, is given for each day in the last column

	East	ern	н	eliograpi	hie	A	rea	Total area
Date	stand civil t	lard	Diff.	Longi- tude	Lati- tude	Spot	Group	for
1932 Oct. 1 (Naval Observatory)	A. 10	m. 11	•	o No spots				
Oct. 2 (Naval Observatory)	12 10	7 30	-41.0		+10.0	6		6
Oct. 4 (Mount Wilson) Oct. 5 (Mount Wilson)	13 16	21 30	-28.0 -13.0	130. 8 130. 8	+9.0 +10.0	1	16	16
Oct. 6 (Mount Wilson) Oct. 7 (Naval Observatory)	11	30 40	-3.0 +12.0	130. 3 132. 1	+10.0 +9.0		17	17

## POSITIONS AND AREA OF SUN SPOTS-Continued

	East	ern	He	eliograpi	hie	A	rea	Tota
Date	stand civil	lard	Diff; long.	Longi- tude	Lati- tude	Spot	Group	for
1933	h.	m.	0		0			
Oct. 8 (Naval Observatory)	10	51		No spot				
Oct. 9 (Perkins Observatory)		5		No spot				
Oct. 10 (Naval Observatory)	11	47		No spot				
Oct. 11 (Naval Observatory)	ii	12		No spot			******	
Oct. 12 (Naval Observatory)	14	27		353.6		6		
Oct. 13 (Perkins Observatory)		15		No spot				
Oct. 14 (Naval Observatory)	111	41	-74.0		+8.0	15	******	1
Oct. 15 (Naval Observatory)	11	50	-61.0	313. 5	+8.0	46		41
Oct. 16 (Perkins Observatory)		47		No spots			******	-
Oct. 17 (Mount Wilson)	11	5	-33.0		+8.0	5		1
Oct. 18 (Mount Wilson)	12	50	-73.0	261. 4	+10.0	206		
			-23.0	311.4	+8.0	7		213
Oct. 19 (Mount Wilson)	18	0	-56.0	262, 3	+10.0		204	
			-6.0	312.3	+7.0		9	213
Oct. 20 (Naval Observatory)	11	49	-49.0	259. 5	+9.0		278	
	1		+3.0	311.5	+7.0	6		
	(		+61.0	369. 5	+5.0	9		293
Oct. 21 (Naval Observatory)		25	-36.0	260.1	+9.0		247	24
Oct. 22 (Naval Observatory)	10	41	-22.0	260.8	+9.0		216	216
Oct. 23 (Mount Wilson)	12	20	-13.0	255. 7	-5.0	7		
			-7.0	261.7	+10.0		110	11
Oct. 24 (Perkins Observatory)	12	55	+5.0	260.1	+7.0		94	94
Oct. 25 (Mount Wilson)	12	15	+19.0	261. 3	+10.0		54	54
Oct. 26 (Naval Observatory)	14	15	+32.0	260. 1	+9.0	*****	77	7
Oct. 27 (Naval Observatory)		3	+43.0	259. 6	+9.0	46		46
Oct. 28 (Naval Observatory)	11	42	+58.0	261. 1	+9.0	46		46
Oct. 29 (Naval Observatory)	12	14	+71.0		+10.0	9		- 1
Oct. 30 (Naval Observatory)	12	55		No spots				
Oct. 31 (Naval Observatory)	11	48	1	No spots	3			
Mean daily area for October.								56

# PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR OCTOBER, 1932

(Dependent alone on observations at Zurich and its station at Arosa) [Data furnished through the courtesy of Prof. W. Brunner, University of Zurich, Switzerland]

October, 1932	Relative numbers	October, 1922	Relative numbers	October, 1932	Relative numbers
1	7 7	11	0 7	21	20
3 4	7	13	8 7	23	a 12
6	0 8	16	8	25	11
8	0	18	d 15	27	8
9	0	19	21 29	30	
				31	7

Mean: 30 days=9.0.

a=Passage of an average-sized group through the central meridian. b=Passage of a large group or spot through the central meridian. c=New formation of a center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central zone. d=Entrance of a large or average-sized center of activity on the east limb.

# AEROLOGICAL OBSERVATIONS

[The Aerological Division, W. R. Gregg, in charge]

By L. T. SAMUELS

Free-air temperatures during October averaged below normal at the northern stations and above normal at the southern stations. The largest negative departures occurred at Ellendale and the largest positive departures at Atlanta. Relative humidities were mostly above normal except in the higher levels at Atlanta and San Diego and in the lower levels at Dallas. The largest departures were positive and occurred at Cleveland and Ellendale.

Free-air resultant wind velocities were in general higher than the normals. Resultant directions were close to normal except on the Pacific coast, where a preponderance of northerly components prevailed.

Airplane observations were made daily at Cleveland, Dallas, and Omaha throughout the month and on all but three days at Atlanta and Chicago, when bad flying weather interfered. Five airplane observations were made at Fairbanks, Alaska, in connection with the International Polar Year; also, a total of 73 sounding balloons were released at Dallas, Ellendale, and Omaha between August and November, 1932, inclusive, of which 48 have been returned to date (December 1, 1932). In nearly every case the balloons penetrated the stratosphere.

Table 1 .- Free-air temperatures and relative humidities during October, 1932 . TEMPERATURE (° C.)

	Atlant (303 m	a, Ga. eters) 1	Chica (195 m	go, Ill. eters) <sup>3</sup>	Cleve Ol (246 m	eland, nio eters) <sup>2</sup>		s, Tex. eters) <sup>3</sup>	N. 1	ndale, Dak. neters)		lk, Va.	Omaha (300 m	, Nebr. eters) <sup>8</sup>	F	acola, la. eters) 4	Ca	Diego, alif. eters) 4	D.	ington, . C. eters) 4
Surface	Mean	Depar- ture from normal	Mean	Depar- ture from normal	Mean	Depar- ture from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Depar- ture from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Depar ture from norms
1,000	12.2	(6) (6) +1. 6 +2. 2	7. 6 8. 2. 7. 0 5. 4	(6) (6) -1. 9 -1. 2	9. 9 10. 7 9. 3 6. 5	(*) (*) +0.4 -0.1	13. 1 16. 3 15. 7 14. 1	(6) (6) +0.6 +1.0	5. 3 5. 1 3. 8 1. 9	-1.9 -2.2 -2.8 -3.1	15. 2 13. 9 11. 6	+0.4 +0.4 +0.6	6. 7 7. 7 9. 0 7. 2	(6) (6) -0.2 -0.5	15. 8 16. 0 15. 5	-2.3 -1.5 -0.1	17. 2 16. 6 16. 7	-2.5 -1.5 -0.7	10. 0 9. 5 8. 4	-3. -2. -1.
,000 ,500 ,000 ,000	10.7 8.6 6.7 0.7 -6.1	+2.6 +2.6 +3.0 +2.3 +1.1	3.9 1.6 -1.0 -6.4 -12.6	-0.3 -0.3 -0.5 -0.8 -1.7	4. 3 1. 8 -0. 7 -5. 8 -12. 4	+0.1 -0.1 -0.2 -0.2 -1.5	12.1 10.1 7.9 3.2 -2.4	+1.2 +1.6 +1.8 +2.3 +1.5	0. 4 -1. 6 -4. 2 -9. 1	-2.4 -1.9 -1.7 -1.0	7. 2 3. 6 -1. 4	+0.1 +0.8 +0.8	5. 6 3. 5 1. 0 -5. 1 -12. 1	+0.1 +0.6 +0.8 -0.1 -1.2	9. 0 3. 8 -0. 5	+1. 2 +1. 4 +1. 5 +1. 5	8.9 3.4 -3.5	+0.1 +0.4 +0.4 +0.4	1.8	1
			1		-	REI	LATIV	E HUN	IIDIT!	Y (PER	CEN'	Γ)				, ,				
Surface	88 81 69 61 48 44 39 31 27	(6) (7) +7 +3 -3 -3 -4 -8 -12	78 69 65 59 57 54 54 48 42	(6) (6) +3 +2 +4 +6 +8 +5 +10	78 71 70 70 65 63 62 52 52	(*) (*) +8 +13 +12 +15 +16 +9 +20	81 63 54 53 52 49 46 44 42	(*) (*) -10 -5 0 +2 +4 +4 +5	72 72 70 67 65 63 62 54	+4 +6 +12 +14 +15 +15 +16 +9	82 75 68 65 58 54	+7 +8 +5 +12 +15 +15	78 70 55 53 50 48 50 46 47	(9) (6) -1 0 -3 -4 0 0 +4	84 75 70 58 51 47 41	+5 +4 +3 +2 +4 +4 +4	67 62 42 25 20 17 15	+3 +2 -4 -8 -7 -7 -7	76 68 63 55 41	+

Temperature and humidity departures based on normals of Due West, S. C.
Temperature and humidity departures based on normals of Royal Center, Ind.
Temperature departures based on normals determined by interpolating between those of Groesbeck, Tex., and Broken Arrow, Okia. Humidity departures based on normals Temperature departures of Grossbeck, Tex.

Naval air stations.

Naval air stations.

Temperature and humidity departures based on normals of Drexel, Nebr.

Temperature and humidity departures omitted because of difference in time between airplane observations and those of kites, upon which the normals are based.

Surface and 500-meter departures omitted because of difference in time between airplane observations and those of kites, upon which the normals are based.

Surface and 500-meter departures omitted because of difference in time between airplane observations and those of kites, upon which the normals are based.

Weather Bureau airplane observations made near 5 a. m.; Navy airplane observations near 7 a. m.; Ellendale kite observations near 9 a. m. (seventy-fifth meridian time).

Table 2.—Free-air resultant winds (meters per second) based on pilot balloon observations made near 7 a.m. (E. S. T.) during October, 1932 [Wind from North=360°; East=90° etc.]

Altitude (meters)	Albu- que Mex. met	N. (1,528	Atla G (309 m	8.	Bism N. I (518 m	oak.	Brow ville, (12 m	Tex.	Burlin V (132 m	t.	W	enne, yo. 873 ers)	I	eago, ll. neters)	Cleve Ol (245 m	eland, nio neters)		llas, ex. neters)	Me	vre, ont. neters)	Jack ville, (14 m			West, la. neters)
m. s. l.	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
Surface 500 1,1,000 1,500 2,2,000 2,500 3,000 4,000 5,	85 249 278 288 282 299	0.8 2.4 4.6 5.6 8.1 8.5	331 29 334 264 294 288 289 295 284	1. 1 1. 2 0. 7 2. 3 4. 3 5. 5 6. 9 6. 2 6. 6	999 297 304 301 307 291	1. 3 5. 4 7. 1 8. 9 10. 0 12. 2 11. 9	8 345 121 138 145 300 317 308 25 234	1. 1 2. 6 2. 0 1. 3 0. 5 1. 3 2. 5 0. 6 1. 6	9 192 206 238 244 270 277 297 322	2.6 6.6 7.0 8.7 10.2 12.3 11.0 10.8	289 288 288 294 295 297	7. 0 10. 4 10. 9 11. 4 12. 7	254 275 283 244 268 278 280	0.9 4.8 7.0 7.9 9.9 10.1 10.5	9 198 230 249 249 255 264 260	3.0 7.4 8.9 8.9 8.9 10.2 9.8	9 74 223 235 254 269 298 300 298	0.2 3.3 3.1 4.6 3.0 3.5 4.9 5.7	e 268 265 288 290 293 298 291	2.0 3.8 6.4 7.4 9.4 9.9 11.2	7 96 150 224 259 281 297 289	0.8 1.5 1.1 2.3 3.7 5.2 6.2 9.4	86 99 105 125 133 131 137 65 8	2. 6. 5. 3. 2. 2. 1. 0.

Table 2.—Free-air resultant winds (meters per second) based on pilot balloon observations made near 7 a.m. (E. S. T.) during October, 1932—Continued

	Ca	ngeles, dif. neters)	Or			phis, nn. eters)	Orlean	ew as, La. eters)	CE	land, dif. eters)	City,	homa, Okla. neters)	Ne	aha, ebr. neters)	A	enix, riz. neters)	City,	Lake Utah 294 cers)	Marie	t Ste. , Mich. neters)	W	ttle, ash. eters)	ton,	hing- D. C. leters)
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
Surface 500 1,000 1,500 2,000 2,000 3,000 4,000 5,000 5,000 5,000 5	10 39 51 42 10 5 356	1.1 1.8 2.6 2.3 2.4 2.2 2.8	73 6 265 241 340 339 320 312	0.3 0.1 0.4 0.2 1.7 3.6 4.6 5.6	227 254 256 269 278 253 276	0.6 3.2 4.2 4.7 4.1 1.6 1.6	39 52 37 338 327 298 246	1.9 3.1 0.6 2.2 2.6 2.4 1.8	21 10 20 360 347 357 13	2.4 4.6 5.4 3.6 4.2 5.4 3.9	216 220 254 265 263 265 264 269	0.8 2.1 5.5 3.9 5.3 5.9 7.0 8.1	331 264 279 287 282 276 279 303	0.7 1.5 4.5 6.7 6.4 8.1 8.9 8.5	98 86 68 96 184 230 227 248	1.6 2.5 2.2 1.1 1.3 2.1 2.5 5.3	145 166 232 277 300 297 309	1.6 2.6 1.4 2.3 4.6 6.7 11.6	33 338 286 274 280 277 282	1. 1 0. 9 2. 4 5. 2 7. 3 10. 1 10. 6	e 132 205 212 222 268 313	1. 0 4. 5 5. 6 4. 5 2. 5 3. 0	321 307 293 284 290 281 282	1. 3. 8. 9. 10. 9. 7.

# RIVERS AND FLOODS

By RICHMOND T. ZOCH

[River and Flood Division, Montrose W. Hayes in charge]

In October there were floods in the Atlantic Coast and East Gulf States and in Texas; those in Texas, however, may be considered a continuation of the September overflows which were mentioned in the MONTHLY WEATHER REVIEW of that month.

The most noteworthy of all the floods of both September and October were those in the lower Rio Grande Valley. The following summary concerning them has been furnished by the official in charge of the Weather Bureau office in Brownsville, Tex.:

Torrential and probably unprecedented rains in Val Verde and adjacent counties in Texas during the last two days of August and the first day of September, and heavy to excessive rains over the Rio Grande and tributary watersheds below Del Rio later in September and early in October caused destructive floods in the lower reaches of the Pecos and Devils Rivers, and in the Rio Grande from Del Rio, Tex., to the Gulf of Mexico. The floods began early in September and lasted well into October in the lower Rio Grande Valley.

Record-breaking crest stages occurred in practically all of the reach from Del Rio to Brownsville.

On account of a rather long and severe dry spell in southern Texas, occurring somewhat earlier than usual, few fall crops had been planted. This minimized the flood damage, but still the loss of property was enormous in the aggregate, and is conservatively estimated to have been more than \$2,500,000 on the American side of the river. In addition, 10 or 12 lives were lost.

The value of all classes of property, including levees, that was saved by the timely warnings and accurate crest stage forecasts is even more difficult to estimate, but would undoubtedly approximate \$500,000. Besides, at least some lives were saved.

The losses due to suspension of business appear to have been offset in a large measure by the semployment the flood created for

3)

The losses due to suspension of business appear to have been offset in a large measure by the employment the flood created for many people who otherwise would have been unemployed.

Table of flood stages in October, 1932 [All dates in October unless otherwise specified]

River and station	Flood stage	Above stages			Crest
	Suago	From-	То-	Stage	Date
ATLANTIC SLOPE DRAINAGE Chenango: Sherburne, N. Y	Feet 8	6	7	Feet 8.7	6.
Susquehanna: Oneona, N. Y. Bainbridge, N. Y. James:	12 11	6	8	14. 7 13. 0	7. 7.

18

Table of flood stages in October 1982 Continued

River and station	Flood	Above stages—			Crest	
	stage	From-	То-	Stage	Date	
ATLANTIC SLOPE DRAINAGE—con.						
Dan:	Feet			Feet		
Danville, VaClarksville, Va	8 12	18 20	19 20	13. 5 14. 3	18. 20.	
Roanoke:	18	18	20	28. 9	19.	
Weldon, N. C.	31	19	22	42.7	21.	
Scotland Neck, N. C.	23	20	24	30.1	23.	
Williamston, N. C	9	26	31	11.2	28.	
Randolph, Va. Weldon, N. C. Scotland Neck, N. C. Williamston, N. C. Cape Fear: Elizabethtown, N. C. Lynches: Effingham, S. C.	20 14	19 23	21 25	24. 9 15. 3	20. 24.	
I bouled.	27	18	22	33. 7	20.	
Cheraw, S. C. Mars Bluff Bridge, S. C	17	20	28	20. 9	24.	
Poston, S. C.	18	25	30	20. 3	27.	
Saluda:			50	20.0		
Pelzer, S. C. Chappells, S. C. Broad: Blairs, S. C. Congaree: Columbia, S. C.	6	16	19	11.0	17.	
Chappells, S. C.	12	16	21	20.4	19.	
Broad: Blairs, S. C.	14	16	19	27.8	18.	
Congaree: Columbia, S. C	15	17	19	21.7	19.	
Catawda-wateree:		17	10	10 "	10	
Catawba, S. C	23	17	18 20	16. 5 25. 5	18.	
Santee:	20	10	23	40.0	20.	
Rimini, S. C.	12	18	27	18.9	22.	
Ferguson, S. C.	12	20	31	14.0	23-24.	
Rimini, S. C	12	26	31	16.1	30.	
Savannah:						
Calhoun Falls, S. C	8	17	17	11.6	17.	
Ellenton, S. C.	14	18	24	22.7	21.	
EAST GULF OF MEXICO DRAINAGE						
Black Warrior: Lock 10, Tusca- loosa, Ala. Tombigbee:	46	17	20	61. 4	18.	
Abardoon Mica	34	18	22	37.4	19.	
Columbus, Miss	25	20	21	25. 5	20.	
Lock 4, Demopolis, Ala.	39	17	(1)	56. 6	26.	
Lock 3, Ala	33	17	(1) (1)	56.8	27-28.	
Lock 2, Ala	46	18	(1)	57. 5	29.	
Chicker Than Enterprise Miss	31	18	(1)	38. 6 20. 9	Nov. 1.	
Columbus, Miss. Lock 4, Demopolis, Ala. Lock 3, Ala. Lock 2, Ala. Lock 1, Ala Chickasawhay: Enterprise, Miss. Pearl: Jackson, Miss.	20 18	18 20	31	20. 9	18. 28.	
MISSISSIPFI SYSTEM	18	20	01	43. 2	40.	
Ohio Basin						
Pigeon: Newport, Tenn	6	17	17	8.1	17.	
French Broad: Asheville, N. C	14	17	19 17	6.5	18.	
Elk: Fayetteville, Tenn	14	16	11	20.0	17.	
WEST GULF OF MEXICO DRAINAGE						
West Fork: Fort Worth, Tex Trinity:	20	Sept. 5	Sept. 5	30.7	Sept. 5.	
Dallas Tex	28	Sept. 6	Sept. 8	34.0	Sept. 7.	
Dallas, Tex. Long Lake, Tex.	40	Sept. 8	Sept. 9	41.3	Sept. 8.	
N116068:		16	P.C.	1		
Cotulla, Tex	15	Sept. 4	Sept. 12	27.0	Sept. 7.	
Three Rivers, Tex	35		Sept. 16	39.6	Sept. 14	

Matured crops\_

100 100

Table of	flood	stanes	in	October.	1932-Continued
I dove of	Juouu	oruges	676	October,	100% Continued

River and station	Flood	Above stages-		Crest		
	stage	From-	То-	Stage	Date	
WEST GULF OF MEXICO DRAIN- AGE—continued	Feet 13	1	8	Feet 15. 1	5.	
Rio Grande:		(Cant 1	Sept. 2	34. 5	Sept. 1.	
Del Rio, Tex	15	Sept. 1 Sept. 7 Sept. 9 Sept. 30	Sept. 2 Sept. 7 Sept. 9 Sept. 30	18. 8 16. 3 17. 2 17. 2	Sept. 1. Sept. 7. Sept. 9. Sept. 30.	
Eagle Pass, Tex		Sept. 1 Sept. 8 Sept. 30 6	Sept. 3 Sept. 10 1 7	47. 8 20. 9 19. 0 17. 9	Sept. 2. Sept. 8. Sept. 30. 7.	
Laredo, Tex	27	Sept. 3	Sept. 4	52.0	Sept. 3.	
Riogrande, Tex	21	Sept. 3 Sept. 10 Sept. 29	Sept. 7 Sept. 12	34. 8 23. 4 31. 0	Sept. 5. Sept. 11. Sept. 30.	
Hidalgo, Tex	22	Sept. 6 Sept. 30	Sept. 15	25. 8 25. 8	Sept. 8.	
Mercedes, Tex	20	Sept. 6 Sept. 25 23	Sept. 21 18 25	21. 8 21. 8 20. 8	Sept. 10-15. 2-4, 10. 24.	
Brownsville, Tex	18	Sept. 9 Sept. 25	Sept. 22 17	18.3 18.3	Sept. 12, 14-16 Sept. 29-3.	

Statement of Flood Losses	
ATLANTIC SLOPE DRAINAGE	
SUSQUEHANNA RIVER IN NEW YORK	
Matured cropsLivestock and other movable property	\$325 1, 000
JAMES RIVER IN VIRGINIA	
Tangible property totally or partially destroyed  Matured crops Livestock and other movable property Suspension of business, including wages of employees  ROANOKE RIVER IN VIRGINIA AND NORTH  CAROLINA	295 13, 450 140 2, 450
Tangible property totally or partially destroyed Matured crops Livestock and other movable property Suspension of business, including wages of employees	10, 000 37, 500 1, 000 2, 500
CAPE FEAR RIVER IN NORTH CAROLINA	
Tangible property totally or partially destroyed	1, 000
PEEDEE RIVER IN SOUTH CAROLINA	
Matured crops	1, 600 100
SALUDA RIVER IN SOUTH CAROLINA	
Matured crops	200
CONGAREE RIVER IN SOUTH CAROLINA	
Matured cropsLivestock and other movable property	1, 000 200
CATAWBA RIVER IN SOUTH CAROLINA	
Matured cropsProspective crops	1, 500 500
SANTEE RIVER IN SOUTH CAROLINA	
Livestock and other movable property	280

SAVANNAH RIVER IN SOUTH CAROLINA AND GEORGIA

3, 000 1, 000

Matured crops\_\_\_\_\_\_Prospective crops\_\_\_\_\_\_

# EAST GULF OF MEXICO DRAINAGE

BLACK WARRIOR RIVER IN ALABAMA

Tangible property totally or partially destroyed.	2, 500
Matured crops	139, 250
Prospective crops	11,000
Livestock and other movable property	7,000
Suspension of business, including wages of employees.	5, 500
TOMBIGBEE RIVER IN MISSISSIPPI AND	

# ALABAMA

Tangible property totally or partially destroyed	12,750
Matured crops	39, 325
Prospective crops	13,000
Livestock and other movable property	16, 950
Suspension of business, including wages of employees	2, 200
CHICKASAWHAY RIVER IN MISSISSIPPI	

# Matured crops\_\_\_\_\_Livestock and other movable property\_\_\_\_\_\_Suspension of business, including wages of employees\_\_

MISSISSIPPI SYSTEM OHIO BASIN

	FRENCH	BRUAD	RIVER	114	NORTH	CARULINA	
Matured	crops						3,000

ELK RIVER IN TENNESSEE	
Tangible property totally or partially destroyed  Matured crops  Livestock and other movable property	1, 000 2, 000 100

# WEST GULF OF MEXICO DRAINAGE

TRINITY RIVER IN TEXAS

Tangible property totally or partially destroyed	34, 800
Matured crops	10, 500
Prospective crops	2, 500
Suspension of business, including wages of employees.	2, 000

NUECES RIVER IN TEXAS	
Tangible property totally or partially destroyed	
Matured crops	1,000
Prospective crops	4, 500
Livestock and other movable property	300
Suspension of business, including wages of employe	

# PECOS RIVER IN NEW MEXICO AND TEXAS

Tangible proper Matured crops_	ty totally or partially destroyed	60, 000 15, 000
	RIO GRANDE RIVER IN TEXAS	

# 

# ESTIMATED VALUE OF PROPERTY SAVED BY

WARNINGS	
Susquehanna River in New York James River in Virginia	\$5,000 19,000
Roanoke River in Virginia and North Carolina	50,000
Cape Fear River in North Carolina  Peedee River in South Carolina	2, 000 23, 000
Saluda River in South Carolina  Broad River in South Carolina	500 700
Congaree River in South Carolina	6, 000
Catawba-Wateree River in South Carolina	9, 500 8, 850
Savannah River in South Carolina and Georgia	3, 000 63, 000
Tombigbee River in Mississippi and Alabama	143,000
Elk River in Tennessee Trinity River in Texas	1, 000 48, 950
Nueces River in Texas Rio Grande River in Texas	15, 000 500, 000
and diamed and in I dads	000, 000

# THE WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

(By the Marine Division, W. F. McDonald in charge)

#### NORTH ATLANTIC OCEAN

# By W. F. McDonald

Atmospheric pressure.—The Atlantic High during October, 1932, was especially stable from the Azores eastward over the Iberian Peninsula and northwestern Africa. This condition is reflected in the average pressure for the month (see Table 1), which was more than a tenth of an inch above normal over the middle and southeastern Atlantic.

Table 1.—Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic and its shores, October, 1932

Stations	Average pressure	Depar- ture from normal	High- est	Date	Lowest	Date
	Inches	Inch	Inches		Inches	
Julianehaab, Greenland			30. 50	1	29.49	14
Reykjavik, Iceland		-0.07	30. 25	3	29. 11	20
Lerwick, Shetland Islands		-0.25	30. 03	5	28. 94	14
Valencia, Ireland		-0.13	30. 24	4	29. 10	8
Lisbon, Portugal	30.09	+0.07	30. 34	23	29. 90	9
Madeira	30. 11	+0.12	30. 37	24	29. 93	3
Horta, Azores	30. 28	+0.17	30.49	24	29. 84	21
Belle Isle, Newfoundland	29. 84	-0.03	30. 52	25	29.00	23
Halifax, Nova Scotia	30.04	0.00	30. 46	26	29. 28	22
Nantucket		-0.02	30. 45	25	29. 51	11
Hatteras	30.05	-0.01	30. 36	8	29.65	17
Bermuda	30.02	-0.05	30. 22	30, 31	29. 56	11
Turks Island	29. 93	-0.02	30, 04	29, 30	29. 84	20
Key West	29, 93	-0.01	30, 10	31	29. 71	16
New Orleans	30, 00	-0.03	30, 28	28	29. 41	16
Cape Gracias, Nicaragua	29. 82	-0.10	29. 92	29, 30, 31	29.72	10

Note.—All data based on a. m. observations only, with departures computed from best available normals related to time of observations, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

A large deficiency in average pressure occurred in the vicinity of Iceland and the British Isles, with the average at Lerwick, Shetland Islands, a fourth of an inch below

normal. There was, similarly, a noteworthy deficiency at Cape Gracias, where the monthly pressure revealed a departure of unusual degree for that region, in that the average for the month was a tenth of an inch below normal. This resulted from the slow movement of a mild disturbance of tropical origin, which is described more fully below.

Cyclones and gales.—October was not a month of severe weather over the Atlantic. Extratropical cyclones were for the most part confined to the more northern tracks. Moderate to fresh gales occurred at scattered places along the main trans-Atlantic steamer lanes on more than half the days of the month but were most frequent and widespread with the advance of the season toward the end of the month.

On the 17th a disturbance took definite form in a previously existent trough of low pressure over mid-ocean, moved slowly northeastward past the Azores during the four days that followed, and caused the strongest gale reported from the Atlantic area during the month. On the 19th the Dutch S. S. Deucalion (G. van der Kooy, master) encountered a north-northeast gale of force 11 near latitude 37° N., longitude 45° W.

Tropical disturbances.—Only one, relatively weak, tropical disturbance of West Indian origin occurred, between the 7th and 18th, as described on page 193 of this Review.

This disturbance reached greatest intensity in the northern Gulf of Mexico, where ships' observers reported gales of force 8 to 9 Beaufort.

Fog.—Fog was not reported south of the forty-fifth parallel except near the American coast. Comparatively few days had fog, even on the northern steamer lanes, the maximum prevalence being over the Grand Banks, where this condition was reported on 8 days, the average number of days of occurrence being only 3 to 5 elsewhere.

# OCEAN GALES AND STORMS, OCTOBER, 1932

Vessel	Voy	rage		at time of parometer	Gale	Time of lowest	Gale	Low- est ba-	Direc- tion of wind	Direction and force of wind	Direc- tion of wind	Direction and high-	Shifts of wind
7 0.502	From-	То—	Latitude	Longitude	began	barom- eter	ended	rom- eter	when gale began	at time of lowest barometer	when gale ended	est force of wind	lowest barom eter
NORTH ATLANTIC OCEAN			.,	. ,				Inches					
Wytheville, Am. S. S Costa Rica, Du. S. S J. A. Moffett, jr., Am.	Antwerp Dover Boston	Barbados Corpus	49 05 N 26 29 N 26 34 N	40 06 W 47 44 W 91 30 W	Oct. 1 Oct. 2 Oct. 5	Noon, 1 4 p., 2 4 a., 5	Oct. 1 Oct. 3 Oct. 5	30. 22 30. 02 29. 92	SE SE N	SE, 7 SSE, 8 N, 7	8	_, 9 SE, 8 N, 8	S-W-NW. SE-S-SE. NW-N.
M. S. Nitonian, Br. S. S. Virginia, Hond. S. S. Afoundria, Am. S. S.	Kingston Boston Glasgow	Christi. Vera Cruz Jamaica Panama City,	42 18 N	70 35 W 20 53 W	Oct. 6 Oct. 7	10 a., 5 9 p., 6 2 a., 7	Oct. 6 Oct. 8	29. 94 29. 67 29. 44	W SSW WSW	NNW, SSW, 6 WSW, 8	WNW.	_, 10 W, 8 NW, 9	W-NNW. SW-W.
Am. Importer, Am. S. S. San Bruno, Pan. S. S. Musa, Pan. S. S. Kenbane Head, Br. S. S.	Hamburg Tela Puerta Cortez Montreal	Belfast	50 00 N 17 00 N 20 09 N 55 32 N	13 30 W 86 58 W 86 19 W 22 06 W	Oct. 9 do Oct. 6	4 s., 8 4 p., 9 10 p., 9 8 a., 9	Oct. 10 do	29. 17 29. 64 29. 74 29. 53	SSW SSW ESE NW	WNW, 7 SW, 6 ESE, 7 NNW, 9	ENE	SSW, 9 ESE, 8 E, 8	SSW-WNW. SSW-SSE.
Am. Importer, Am. S. S. West Imboden, Am. S. S. West Imboden, Am. S. S. El Estero, Am. S. S. Duquesne, Am. S. S. Chester Valley, Am. S. S.	Copenhagen  Hamburg New York Galveston Rotterdam Galveston	Wilmington, Del. New York Riode Janeiro Boston New Orleans Genoa	41 30 N 45 50 N 38 56 N	8 10 E 31 41 W 61 24 W 69 30 W 16 13 W 54 19 W	Oct. 8 Oct. 10 Oct. 9 Oct. 12 -do Oct. 10	Noon, 10-4 a., 10	Oct. 13 Oct. 12	29. 18 29. 68 29. 63 29. 67 29. 88 29. 67 29. 50	W NE NW N E	SE, 7 W, 8 SW, 5 NW, 8 N, 7 S, 6 SSE, 4	SE SW NW N SSE NW	SE, 9 NW, 10 ENE, 9 -, 8 N, 8 SE, 8 NN W, 8	SE-E.  ENE-SW. Steady. Do.
Wm. Boyce Thompson, Am. S. S. Comal, Am. S. S. El Almirante, Am. S. S. Memphis City, Am. S. S. Greystoke Castle, Br.	Marcus Hook  New Orleans.  do  New York  Port Said		28 40 N 28 48 N 31 00 N 34 00 N 36 55 N	91 15 W 88 52 W 79 00 W 74 00 W 44 20 W	Oct. 15 Oct. 16 Oct. 17	4 p., 15 2 a., 16 4 p., 17 4 p., 17	Oct. 16 Oct. 17 Oct. 18 Oct. 17 Oct. 18	29. 39 29. 69 29. 79 29. 89	SE SE Var	SSW, 8 SE, 8 SSE, 8 N, 4	SW SE SW	SW, 9 -, 9 SE, 0 N, 9	Steady. Do. SE-SW. Steady.
M. S. Exeter, Am. S. S. Deucalion, Du. S. S. Scanyork, Am. S. S. Flandre, Fr. S. S.	New York Haiti Copenhagen - St. Nazaire	Palma Havre Philadelphia Central Amer-	39 58 N 36 46 N 56 52 N	70 10 W 44 58 W 24 52 W 30 00 W	Oct. 19 Oct. 17 Oct. 19 Oct. 21	2 a., 19 4 a., 19 11 a., 19 11 p., 21	Oct. 23 Oct. 20 do Oct. 22	29. 71 29. 51 28. 91 29. 49	SE NNE SE SW	E, 3 NNE, 11 WNW, 9 SW, 8	SW NNE W NW	SE, 9 NNE, 11 W, 9 SW, 8	Steady. SE-S-W. SW-NW.
City of Newport News,	Havre	ica. Baltimore	40 00 N	51 00 W	Oct. 22	8 a., 22	do	29. 59	8	8, 9	NW	-, 9	S-NW.

# OCEAN GALES AND STORMS, OCTOBER, 1932-Continued

Vessel	Voy	7age		at time of arometer	Gale	Time of	Gale	Low- est	Direc- tion of wind	Direction and force of wind	Direc- tion of wind	Direction and high-	Shifts of wind
v essei	From-	То-	Latitude	Longitude	began	barom- eter	ended	ba- rom- eter	when gale began	at time of lowest barometer	when gale ended	est force of wind	lowest barom- eter
NORTH ATLANTIC OCEAN—Continued			0 /	0,				Inches					
West Madaket, Am. S. S. Marie Leonhardt, Ger. S. S.	Antwerp Bremen		50 30 N 51 12 N	1 00 W 26 05 W	Oct. 23 Oct. 26	8 p., 23 Noon, 26.	Oct. 24 Oct. 26	29, 63 29, 92	sw w	WSW, 9 W, 8	WNW	WSW, 9 NW, 10	wsw-w.
Hoxie, Am. S. S	Cork Newcastle on Tyne.	New York	50 44 N 57 32 N	14 51 W 25 10 W	Oct. 28	4 a., 27 11 p., 28	Oct. 28 Oct. 29	29. 64 29. 62	NW WSW	NW, 7 WNW, 8		NW, 10 WNW, 10.	
Themisto, Du. S. S Motocarline, Belg. M. S. Marie Leonhardt, Ger. S. S.	Durban Antwerp Bremen	Montreal Baytown	41 28 N 50 21 N 49 20 N	52 40 W 2 14 W 42 17 W	Oct. 29 Oct. 30	9 a., 29 10 p., 29 Noon, 30.	Oct. 31	29. 82 29. 37 29. 72	S W SW	8, 9	SW NNW W	WSW, 9 WSW, 9 WSW, 10_	SW-WNW. S-W-NW. Steady.
Themisto, Du. S. S.	Durban		44 32 N	56 14 W	do	1 a., 31	do	29.86	SW	8W,7	SW	WSW, 9	SW-WNW.
NORTH PACIFIC OCEAN													
Slemmestad, Nor. M. S. Stanley Dollar, Am. S. S. Silveray, Br. M. S. Kiyo Maru, Jap. S. S. Pres. Polk, Am. S. S. New York, Am. S. S. Holystone, Br. S. S. Potter, Am. M. S. Potter, Am. M. S. Golden Wall, Am. S. S. New York, Am. S. S. Stanley Dollar, Am. S. S. Golden Sun, Am. S. S.	San Pedro Philippines Gorontalo San Pedro Honolulu Dairen Yokohama Panama Shanghai Siain, P. I. San Francisco Dairen Philippines C olumbia	Los Angeles San Francisco Yokohama Kobe San Francisco. Los Angeles Vancouver San Pedro San Francisco. Yokohama San Francisco.	36 00 N 32 55 N 43 40 N 36 46 N 14 15 N 43 00 N 40 10 N 47 20 N 46 30 N	173 53 E 136 49 E 159 36 W 174 40 W 145 00 E 148 55 E 146 33 E 95 45 W 167 30 E 175 25 W 172 23 W 172 23 W 172 15 E 161 51 E 146 55 W	Oct. 2dodo Oct. 3 Oct. 4dodo Oct. 4 Oct. 5do Oct. 6 Oct. 7 Oct. 8 Oct. 9 Oct. 10	8 p., 3 5 p., 4 8 a., 5 Mdt., 4 6 a., 6 1 a., 7 4 p., 6 2 a., 7 2 p., 10 10 a., 10	Oct. 5do Oct. 6 Oct. 8 Oct. 7 Oct. 10	29. 78 29. 05 28. 90 28. 60 29. 82 29. 17 29. 39 28. 71 29. 66	SSWWSWSSESSENSWWWSWWWWW	W, 8 NW, — 11. SE, — W, — SSE, 10. NE, 9. SE, 12. NNE, — WNW, — WSW, — NW, 2 WNW, — SW, 10 WNW, 8	S NW NW NWE NNE W	NW, 11 E, 10 WNW, 8 SSE, 10 NE, 9 SSW, 12 N, 9 W, 8 W, 8 W, 9 WNW, 9 SW, 10	SW-W. N-NW-W. SE-SSW. WSW-W. Steady. ENE-NE. SE-SSE. N-NNE. W-NW. W-WSW. NW-W. Steady. SHEADY.
Soyo Maru, Jap. M. S Do Niagara, Br. M. S Stanley Dollar, Am. S. S. Grays Harbor, Am. S. S.	San Francisco  do Victoria Philippines T s u g a r u	Honolulu	45 18 N 36 37 N 46 35 N 43 05 N 49 55 N	170 20 E 143 37 E 128 44 W 152 58 W 179 02 E	Oct. 12 Oct. 17 Oct. 13 Oct. 17 Oct. 20	4 a., 12 3 a., 17 2 p., 13 5 a., 18 4 p., 22	Oct. 17 Oct. 15 Oct. 18	29. 52 28. 94 29. 53	W NW S SSE SSE	SSE, 3 NW, 8 S, 7 S, 10 WSW, 8	W	W, 8 NW, 9 W, 10 S, 10 WSW, 9	SSE-W. ENE-NW. S-SW. SSE-S-W. WSW-WNW
Tyndareus, Br. S. S Oregonian, Am. S. S Kiyo Maru, Jap. S. S	Strait. Yokohama Balboa Yokohama	Los Angeles	49 58 N 14 55 N 39 42 N	167 28 W 94 03 W 166 30 E	Oct. 25 Oct. 27 Oct. 30	9 a., 26 4 p., 27 8 a., 30	do		S N. ESE	S, 8 N, 8 ESE, 5	SW NNE SSE	S, 9 N, 10 SE, 8	S-SSW. Steady. ESE-SSE.

# NORTH PACIFIC OCEAN, OCTOBER, 1932

By WILLIS E. HURD

Atmospheric pressure.—The average pressure over the North Pacific Ocean for October, 1932, in general departed very little from normal. The Aleutian Low was strongly developed, with pressures from the western Gulf of Alaska to the central Bering Sea averaging less than 29.6 inches. The North Pacific High crested near the California coast. A rather peculiar pressure abnormality occurred in the China Sea, with Naha reading 0.08 inch above and Manila 0.06 below the average.

Table 1.—Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, October, 1932, at selected stations

Stations	Average pressure	Depar- ture from normal	Highest	Date	Lowest	Date
Point Barrow	Inches	Inch (1)	Inches	(1)	Inches	(1)
Dutch Harbor	29, 57	-0.08	30, 54	25, 31	28, 60	(-)
St. Paul	29, 58	-0.05	30, 52	31	28, 60	
Kodiak		-0.01	30. 50	5	28. 36	19
Juneau	29, 88	+0.01	30. 53	5	29. 23	14
Tatoosh Island	30.06	+0.05	30. 56	24	29.47	13
San Francisco		+0.01	30. 25	25	29. 72	
Mazatlan	29. 83	-0.08	29, 96	28, 31	29.74	3, 1
Honolulu	30. 01	+0.01	30, 12	15	29. 84	
Midway Island	29, 99 29, 85	-0.04 +0.01	30. 30 29. 90	26 7, 31	29, 76 29, 74	2
Guam	29. 83	-0.06	29, 88	7, 9	29.74	2
Naha		+0.08	30, 18	11	29. 80	
Chichishima		+0.04	30. 16	11, 21	29, 42	
Nemuro	29, 92	10.01	30. 22	14	29, 40	

<sup>1</sup> Data for 19 days only—not used.

Note.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Cyclones and gales.—During the month the region of the North Pacific HIGH was unusually exempt from

cyclones. The majority of Lows moved in higher latitudes, and comparatively few gales occurred south of latitude 35° N. The number of days with gales was somewhat in excess of that for September, and the weather was rougher, owing to the greater frequency of disturbances, but the winds increased but little in violence, and in our reports no extratropical gales exceeded force 10. In the region of their greatest frequency, south and southwest of the central Aleutians, moderate gales were frequent, but those in excess of force 7 occurred on a few days only in any locality. The accompanying table of gales shows their distribution.

Tropical disturbances.—Apparently three disturbances of tropical origin occurred in far eastern waters. The earliest originated on the last of September, and on the 1st to 3d of October moved slowly northward as a typhoon in the vicinity of the Ogasawara Islands. On the 4th, with greatly increased speed, it passed southeastern Honshu, and was southeast of the Kuril Islands on the 5th. This storm on the 4th caused the highest wind velocity, force 12, thus far reported for the month, and caused gales of force 11 and 10 on the 3d and 5th, respectively.

The second disturbance originated east of the North China Sea on or about the 7th and moved northeastward at some distance from the Japanese coast until the 10th, when it entered the low-pressure region of the Aleutians. During its passage gales of force 9 to 10 were reported from the Ogasawara Islands northward.

The third tropical cyclone developed in lower Philippine waters on the 23d, and from the 24th to 27th it lay in the channel between Luzon and Taiwan, later moving west-southwest into the South China Sea. There are no details as to its intensity except for reports of northerly gales near Taiwan and Luzon on the 26th.

In Mexican waters northers of moderate gale force occurred on the 6th and 21st over or south of the Gulf of Tehuantepec, of strong gale force on the 5th, and of whole gale force on the 27th.

On the 11th the Tehuantepec region and neighboring Central American waters were disturbed by a depression which crossed the Yucatan Peninsula from the Caribbean into the Gulf of Mexico. On the Pacific side this depression resulted in moderate gales. The northeast monsoon.—Owing to the strong formation of anticyclones on the Asiatic coast, the northeast monsoon blew with considerable force in the China Seas on several days

Fog.—Fog lessened materially over the whole Pacific, except along the American coast, as compared with its occurrence in September. It formed on only a few scattered dates along the northern routes. It was observed on 19 days at one place or another on the California coast.

# CLIMATOLOGICAL TABLES

# CONDENSED CLIMATOLOGICAL SUMMARY

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the

greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Condensed climatological summary of temperature and precipitation by sections, October, 1932

[Compiled by Annie E. Small]

[For description of tables and charts, see REVIEW, January, p. 37]

				remp	eratur	е					Preci	pitatio	n	
Section	verage	e from mal		M	[onth]	y extremes			ауегаде	e from mal	Greatest monthl	У	Least monthly	
	Section average	Departure from the normal	Station	Highest	Date	Station	Lowest	Date	Section a	Departure from the normal	Station	Amount	Station	Amount
Alabama Arizona Arkansas California Colorado	62.2 -0.4 Ag 60.8 -1.6 3s 60.0 +0.2 Gr 45.7 -1.2 La		Thomasville	101 94 106	25 7 1 18 6 1	Valley HeadAlpineLead Hill.Lake Sebrina.Pearl.	10 26 11	7 18 6 18 25	In. 6. 43 1. 22 3. 41 0. 35 0. 93	In. +3.76 +0.45 +0.24 -0.80 -0.30	Dothan Pinal Ranch Arlberg Cuyamaca Steamboat Springs	In. 12. 41 3. 95 6. 12 5. 52 3. 05	Union Springs Tuba City Springbank 77 stations 3 stations	In. 1, 27 0, 00 0, 91 0, 00 T.
Florida	73.7 64.8 45.5 54.3 54.7	+0.7 -0.1 -1.2 -1.0 +0.1	4 stations	92 91 86	1 4 19 3 2 2	Garniers (near) 2 stations Blackfoot Dam 2 stations Marengo	37 29 0 21 22	1 7 7 20 30 30	4. 31 5. 09 1. 12 3. 91 3. 93	+0.04 +2.36 -0.30 +1.19 +1.19	Miami Hartwell Roland Elgin Laporte	17. 43 10. 76 5. 29 6. 09 6. 85	Kissimmee. Fargo. 2 stations. Quincy. Vevay.	0, 72 1, 92 0, 00 2, 20 2, 20
Iowa Kansas Kentucky Louisiana Maryland-Delaware	49. 6 55. 2 56. 8 66. 2 56. 7	-1.9 -1.7 -1.4 -1.9 +0.5	4 stations	92 85	1 6 1 3 18 3	2 stations	19 14 24 29 22	30 29 30 27 31	1. 79 0. 99 3. 31 5. 23 6. 39	-0.61 -1.12 +0.54 +1.91 +3.51	Tipton (near) Phillipsburg Jenkins Lafayette State Sanatorium,	4. 80 3. 27 5. 33 10. 16 12. 68	Creston	0. 32 0. 18 1. 85 0. 30 3. 53
Michigan Minnesota Mississippi Missouri Montana	48. 5 43. 0 62. 8 55. 7 42. 1	-0.5 -2.7 -2.4 -1.7 -2.2	Paw Paw 2 stations 5 stations Lamar Big Timber	87 89 90	1 1 2 18 1	Roscommon (No. 2). Mizpah	14 5 31 22 -10	13 9 6 1 6	4. 70 1. 51 6. 32 3. 45 1. 50	+1. 97 -0. 42 +3. 67 +0. 56 +0. 51	Md. Harrisville Pigeon River Bridge 2 stations Greenville Crow Agency	7. 63 5. 59 9. 95 7. 32 5. 26	Alpha	0. 96 0. 26 1. 33 0. 96 0. 33
Nebraska Nevada New England		-2.2 +0.1 +2.3	3 stations	96 86	1 5 9	GordonZorra Vista Ranch Keene (near), N. H	2 5 16	10 1 20 14	1. 29 0. 18 4. 95	-0.31 -0.46 +1.38	Bruning Beatty Pinkham Notch, N. H.	2. 28 1. 95 10. 04	Kimball	0. 10 0. 00 1. 22
New Jersey New Mexico	56. 2 52, 2	$+1.4 \\ -1.3$	Bridgeton Agricultural College_	89 93	16	Runyon Crown Point	21 2	31 25	5. 85 1. 02	+2.18 -0.17	Charlotteburg	9. 64 4. 25	Asbury Park	3. 53 0. 06
New York North Carolina North Dakota Ohio Oklahoma	52. 5 60. 5 38. 3 54. 4 60. 7	$\begin{array}{c} +2.6 \\ +0.6 \\ -5.2 \\ +0.7 \\ -1.2 \end{array}$	5 stations Nashville New England Middleport Cherokee	83 89 90 85 97	1 2 4 1 3 18	2 stations	14 -3 24	14 28 29 30 29	6. 04 7. 46 2. 31 3. 47 2. 09	+2.71 +4.03 +1.27 +0.79 -1.19	McKeever Rock House Larimore Lima Okmulgee	11. 08 17. 16 4. 11 5. 34 5. 77	Caneadea Dam Fayetteville Tagus Philo (1) Buffalo	2. 47 3. 21 0. 66 1. 61 0. 24
Oregon	50. 5 53. 8 63. 7 44. 7 58. 7	+1.0 +1.4 +0.1 -3.5 -0.8	Jacksonville Hyndman Trenton Vermillion Newbern	86	3 3 24 2 1	2 stations	20	24 1 14 7 31 28	1. 87 5. 31 6. 99 1. 18 5. 39	-0.01 +2.05 +3.93 -0.16 +2.57	Headworks Newport Caesars Head Rockford Tullahoma	13. 66 11. 90 14. 51 3. 30 9. 87	Fremont Sharon Aiken Onida Milan	0. 07 1. 78 3. 47 0. 46 2. 24
Texas	65. 2 47. 7 58. 0 50. 0 54. 9	$ \begin{array}{r} -2.4 \\ -0.8 \\ +0.6 \\ +0.9 \\ +0.5 \end{array} $	BookerSt. George Christchurch Rock Island Martinsburg		17 1 14 1 2 16	Alpine Woodruff Emory Republic Marlinton	23 0 26 10 22	26 26 7 29 29	0. 93 0. 62 7. 01 3. 55 3. 91	-1.83 -0.63 +3.88 +0.38 +0.82	Brownsville Santaquin Roanoke Paradise Inn Harpers Ferry	6. 36 2. 90 12. 01 17. 27 7. 21	15 stations	0. 00 0. 00 3. 83 T. 2. 12
Wisconsin Wyoming	45. 5 39. 9	$-2.4 \\ -2.7$	5 stations 2 stations	84 89	1 1 1 1	2 stationsdo	14 -7	1 10 1 20	1. 99 1. 24	-0.44 -0.06	Beloit	4. 87 4. 58	Tomahawk Leo (near)	0. 73 0. 16
Alaska (September)	42. 2	-2.1	Petersburg	70	28	McKinley Park	5	22	4. 15	+0.65	Yakutat	23, 61	Shishmaref	0. 36
Hawaii	74.3	+0.5	Mahukona	93	1	Kanalohuluhulu	45	18	2.44	-3.23	Hiloa-Manawaio- puna Divide.	18. 00	6 stations	0.00
Puerto Rico	78.8	+0.7	Central Aguirre	96	1 28	Guineo Reservoir	51	1	7. 44	-0.77	San German	15, 29	Santa Isabel	2.11

Other dates also.

Table 1.—Climatological data for Weather Bureau stations, October, 1932 (Compiled by Annie E. Small)

			on of nents		Pressu	re		Te	mpe	rati	are e	of th	e ai	•	1		of the	lity	Pre	cipitat	ion		1	Wind			160	110	1	tenths		ice on
District and station	above rel	meter	neter	educed of 24	reduced in of 24	-	8x.+	from			mnm			minimum	test daily range	ĕ	temperature dew point	ve humic		from la	0.01, or	ment	direc-		Iaxim: velocit			dy days	90	cloudiness,	lall	t, and i
	Barometer above	Thermometer	A n e m o n above gr	Station, reduced to mean of 24	Sea level, r to mean	Departure	Mean ma mean min.	Departure	Maximum	Date	Mean maximum	Minimum	Date	Mean mini	Greatest	Mean wet t	Mean tem	Mean relative humidity	Total	Departure	Days with 0.01, or more	Total movement	Prevailing tion	Miles per	Direction	Date	Clear days	Partly cloudy	Cloudy days	Average clo	Total snowfall	Snow, sleet, and
New England	Ft.	Ft	1	In.	In.	In.	°F. 53.8	°F.	° F		• F	°F.		° F	°F.	°F.	°F.	% 78	In. 4, 93	In. +1.7		Miles								0-10 6.1	In.	In
Castport Greenville, Me Portland, Me Portland, Me Concord Gurlington Northfield Goston Nantucket Block Island Providence Hartford New Haven Middle Atlantic States	159	12	6 168 4 90 1 46 5 251	28. 86 29. 96 29. 76 29. 56 29. 96 30. 06 30. 06 29. 86 29. 86	30. 00 30. 02 30. 02 5 29. 99 30. 02 30. 02 30. 03 30. 04	02 03 05 02 01 02 02 02 02	47. 1 52. 6 52. 0 50. 8 48. 6 57. 1 57. 2 56. 6 55. 6 55. 5	+2.5 +2.3 +1.6 +3.1 +3.8 +3.6 +1.5 +3.6 +4.3 +2.3	76 74 79 79 75 76 81 76 81 77 70 47 88 79 77 70 47 88 79 77	4 9 9 3 3 9 10 6 9	55 55 59 61 59 58 64 63 61 63 64 63	30 27 32 23 27 21 38 42 42 33 34 35	31 31 14 14 24 24 14 14 31 14 14	44 40 46 43 43 39 50 52 52 48 48 49	23 37 24 38 31 37 26 18 17 25 30 26	50 53 53 50	44 44 46 49 50 46 48	79 81 75 78	3. 61 2. 83 3. 43 2. 70 6. 06 3. 57 7. 18 7. 66 5. 51 4. 49 4. 56 5. 51	+0.3 -0.2 +3.1 +0.7 +4.0 +4.3 +2.0 +1.4 +1.0 +1.8	17	5, 502 7, 726 4, 851	nw. s. se. s. w. w. w. nw.	32 26 35 21 38 27 27 44 39 37	s. w. se. s. ne. e. w.	19 222 27 12 16 27 19 18 11 28	5 13 10 3 2 6 13 11 14	6 6 7 7 4 9 12 8 10 6 11 10	20 11 14 24 20 13 10 10		0.0 T. 0.0 T. 0.0 0.0 0.0 0.0 0.0 0.0 0.	0.0000000000000000000000000000000000000
lbany singhamton ew York ellefonte	97 871	10	0 68	29. 92 29. 06 29. 69	30. 02 30. 02	04 04	57.7 55.0 53.4	+2.9		2 3	63 62	31 28	14	47	28 36	49	45	76	5.71 4.79 6.79	+2.7 +2.1 +3.8	10 12	6, 172 4, 871	s. nw.	30 24		27	5	11 4	15 26	6. 0 6. 5 8. 6	T. T.	0.
ew York ellefonte larrisburg	314 1, 050 374	41	4 454 5 42 4 104	28. 9. 29. 6	30. 02	03	51.3	+1.8	76	3 3	63 62 65 61 63 67 63 62	39 25 35	13 31 31	51 42 48	23 38 27	52 46 50	47 43 45 48 45	73 78 73	5. 03 5. 42 8. 96	+1.5	11	5, 775	nw. sw. w.	27	nw.	26 12 26	1 7 2 6	10 12 9	14 17 16	6.3 7.6 6.9	0.0	0. 0. 0.
larrisburg hiladelphia teading cranton tilantic City andy Hook renton saltimore Vashington ape Henry ynchburg Vorlok tichmond Vytheville	808 52 22	3 1	3 367 1 103 2 103 7 172 0 58 9 183 0 215 2 85 8 54 3 188 0 205 1 52 9 58	29, 66 29, 16 29, 96 30, 01 29, 86 29, 90 30, 00 29, 30	3 30. 06 9 30. 04 9 30. 06 9 30. 06 1 30. 03 1 30. 04 2 30. 04 2 30. 05 5 30. 06 6 30. 06 8 30. 06	01 03 04 04 04	58. 8 58. 0 58. 6 58. 0 63. 4 58. 8 63. 4 60. 4	+1.8 +1.1 +2.1 +1.9 +1.4 +0.4 +0.6 +1.3 +0.3 +0.8	81 79 81 81 84 78 81 81 82	3 3 1 2 3 2 3 5 3	67 63 62 65 64 66 66 67 70 69 71 71 65	39 43 36 39 36 43	14 14 13 31 14 31 14 31 31 14 14 31 29 29 29 29	47 45 51 42 48 52 48 46 52 52 48 51 49 57 49 56 50 44	23 38 27 25 29 34 26 20 28 28 31 26 35 24 34 36	52 46 50 52 50 48 54 53 51 53 52 58 52 58 54 48	48 45 44 51 49 47 48 47 55 48 54 50 44	73 78 73 71 71 75 78 77 76 73 74 78 74 80 79	4, 30 5, 64 5, 10 4, 63 4, 05 4, 69 7, 17 7, 40 3, 85 8, 86 6, 58 5, 11	+1.5 +2.5 +2.1 +1.4 +0.3 +1.9 +4.3 +4.6 +0.8 +5.7 +0.9 +3.7	9 10 10 9 10 10 10 10 10 7 11 8 10 9	9, 773 5, 729 5, 277 12, 675 11, 285 8, 497 8, 154 5, 285 9, 047 5, 034	W. Se. SW. W. M. SW. SW. SW. NW. SW. SW. SW. NW. S. SW. NW. S. SW. NW. S. SW. NW. SW. SW. SW. SW.	38 26 24 49 41 37	s. e. nw. e. nw. w. ne. nw. nw.	6 17 5 17 12 12 12 17 11 28 26 6 26 29	10 5 5 13 14 11 9 12 14 17 12 13 14	8 11 13 4 4 7 10 4 8 4 8 5 4	13 15 13 14 13 13 12 15 9 10 11 13 13	6.3 7.6 6.9 5.7 6.4 5.6 5.5 6.0 5.8 4.5 4.6 5.4 5.1	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
South Atlantic States	2, 253	8		27. 71		03	65, 3 56, 2			24	68	30	7	45	39	50	46	79	6. 52		9	6, 355	nw.	27	e.	16				4.6	0.0	0.
sheville harlotte reensboro fatteras faleigh vilmington harleston olumbia, S. C. ugusta. avannah acksonville.  Florida Peninsula	886 11 376 72 48 351 1, 039 182 65 43	10 7 1 4 13 6 7 20	4 267 6 56 5 50 3 146 3 106 1 92 1 57 9 146 2 77 3 152 9 245	29, 2) 29, 10 30, 00 29, 64 29, 96 29, 66 28, 94 29, 80 29, 90 29, 90	30. 05 30. 06 30. 04 30. 04 30. 02 30. 03 30. 03 30. 03 30. 01	03 03 02 04 04 04 03 01		+1.2+0.4	82 78 83 82 81 84 83 81 86 87 85	11 24 18	76 75 71 77	30 39 32 46 41 45 51 41 40 42 50 49	29 7 29 7	53 48 61 53 58 62 55 54 61 64	29 34 23 28 26 20 31 25 35 24 24	55 53 63 56 62 64 58 55 58 63 65	51 51 60 51 60 61 54 50 56 61 63	74 86 78 73 85 79 75 71 80 83 80	7. 52 7. 78 5. 56 7. 42 5. 42 6. 98 6. 35 12. 68 6. 08 4. 71 2. 62 9. 08	+4.6 +4.6 +2.2 +3.7 +3.8 +9.6 +1.7 -1.8	9 12 8 9 9 8 7	3, 663 5, 431 8, 788 6, 429 6, 230 7, 864 4, 711 5, 911 3, 838 8, 425	s. sw. s. ne. ne. ne.	15 24 35 25 28 38 21 28 21	e. s. nw. se. s.	16 26 28 17 6 16	16 15 13 14 15 14 14 18 15 16 11	9 6 8 6 9 7 9 3 6 3 10	9 10 10 11 7 10 8 10 10 12 10	4.1 4.6 4.7 4.9 4.1 4.7 4.3 4.2 4.3 5.4 5.1	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0. 0. 0. 0. 0. 0. 0.
ey West  tiami ampa itusville  East Gulf States	22 25 35 44	1 12 8	0 64 4 168 8 197 5	29. 91 29. 94 29. 94 29. 93	29, 93 29, 98 29, 98 29, 98	+.01	80. 5 79. 0 75. 5 76. 0		1	5 4 13 4	85 84 84 84	72 66 51 54	7 7 7 7	76 74 67 68	14 16 29 24	74 73 69	72 70 66		7. 48 17. 43 2. 32 2. 73 7. 19	+1.5 +9.0 -0.8	13 6 9	7, 576 7, 871 8, 466	Se.	26 27 32	ne.	16 8 16	10 12 14 11	10	6 15 7 2	5. 1 5. 9 4. 6 4. 7	0, 0 0, 0 0, 0 0, 0	0.
tlanta facon homasville palachicola ensacola nniston irmingham fobile fontgomery orinth feridian icksburg ew Orleans  West Gulf States	1, 173 370 273 36 56 741 700 57 223 469 375 247 53	1 14 12 10 8 6	1 48 9 185 9 1 48 5 161 0 112	29. 98 29. 96 29. 78 29. 78 29. 62 29. 77 29. 96	30. 03 30. 03 30. 03 30. 03 30. 03 30. 03	03 04 04 03 03 03	61. 4 64. 0 68. 0 69. 9 67. 1 61. 4 62. 4 64. 8 61. 6 62. 1 63. 7 69. 2	-1.6 -0.5 -0.2 -2.8 -1.0 -2.4 -2.9 -1.8 -2.2 -3.0 -1.8	78 83 85 85 83 81 81 87 83 84 83 85 86		70 75 78 77 75 73 76 75 74 73 74 77	39 40 43 48 43 33 37 43 41 35 36 41 47	12 7 7 7 6 7 12 6 12 12 7 12 12	53 58 62 59 50 52 57 54 50 51 54 61	29 34 29 23 30 39 33 26 31 39 33 29 22	54 57 61 64 62 55 61 57 56 56 62	50 53 59 62 60 51 58 53 53 53	72 77 81 81 82 78 81 74 81 76 76	6. 90 5. 03 8. 86 7. 63 5. 89 5. 79 7. 27 10. 08 4. 67 7. 51 8. 76 5. 52 8. 43	+4.3 +2.7 +5.9 +4.4 +1.7 +4.8 +6.5 +2.2 +6.4 +2.8 +5.1	8 7 8 8 9 10 8 10 8	7, 642 5, 000 6, 072 6, 926 9, 354 5, 103 6, 888 5, 150 3, 907 5, 296 5, 498	nw. n. n. nw. n. e. se.	277 211 422 388 45 311 399 25 28 21 21	se. nw. se. se.	26 16 31 15 15 15 31 31 31 31	14			4.4 4.5 4.8 4.3 4.2 4.5 4.3 4.5 4.3 4.5 4.3 4.0 3.3	0. 0 0. 0 0. 0 0. 0 0. 0 0. 0 0. 0 0. 0	0.0000000000000000000000000000000000000
hreveport. entonville. ort Smith ittle Rock ustin rownsville. orpus Christi allas ort Worth alveston ouston alestine ort Arthur an Antonio aylor.	1, 303 457 357 605 57 20 512 670 54 138 510 34	1 70 13 13 8 1 22 10 10 29 6 5	2 2277 1 44 9 94 6 153 6 148 3 100 1 78 0 227 6 114 8 114 2 314 4 72 8 66 2 301 8 51	29. 78 28. 62 29. 53 29. 65 29. 96 29. 96 29. 30 29. 94 29. 86 29. 50 29. 27 29. 44	30. 02 29. 99 30. 01 30. 02 30. 00 29. 96 30. 01 30. 01 30. 01 30. 03 30. 01 30. 03 30. 03	03 06 04 04 02 03 02 +. 02	65. 9 56. 8 61. 2 61. 8 67. 9 72. 2 64. 6 65. 8 71. 0 69. 4 65. 6 69. 2 69. 2	-0.7 -1.2 -1.6 -1.8 -0.4 -1.0 -1.0 -1.7 -0.9 -1.7 -1.3 -1.8	90 86 89 85 90 90 87 90 84 88 87 87 87	18 18 18 17 2 31 17 18 3 18 2 18 17	78 70 73 72 81 81 80 76 78 76 79 77 78 80 80	41 29 36 39 42 52 50 40 41 52 44 40 45 42	6 6 11 6 26 26 26 26 26 26 26 26 26 26 26 26 2	54 44 49 51 55 66 64 53 54 65 60 54 60 58 53	35 36 35 32 34 24 29 31 36 28 35 33 29 31	56 51 52 57 67 65 55 65 56 62 59	49 45 46 51 65 62 48 61 51 59 53	64 65 63 79 77 61 76 67 78 63	1. 17 3. 08 4. 30 3. 34 0. 10 6. 36 1. 59 1. 66 1. 30 1. 06 1. 58 1. 62	-1.5 +1.3 +0.6 -3.1 +3.1 -1.8 -1.1 -1.2 -3.1 -1.7 -1.7 -1.8 -1.6	578364556353	5, 618 6, 493 6, 012 7, 058 7, 266 8, 746 6, 467 7, 696 9, 159	s. e. s. s. se. s. se. se. s. se. s. se. s. se. s. s. se. s.	41 26 24 27 26 29 27 52 27 30 30 21 24 31	s. n. n. n. n. n. n. s. nw. nw. n.	31 28 4 16 4 4 4 31 28 25 5 4	18 17 18 15 18 19 19 17 21 17 21 17 20	6 4 7 7 10 9 8 4 4 7 9 5 9 13	10 6 9	3. 5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.

TABLE 1 .- Climatological data for Weather Bureau stations, October, 1932-Continued

		ratio		191 1	Pressur	е		Ten	nper	atur	e of	the	air			ter	of the	lity	Prec	ipitat	ion		,	Wind						tenths		s on
District and station	above	meter	neter	reduced of 24	reduced of 24	al from	max. + min. +2	e from			maximum			mum	dally		dew point	ive humid		from	0.01, or	movement	direc-		aximu			dy days	20		[Pa]]	t, and ic
	Barometer sea lev	Thermometer above ground	A nemor	Station, reduced to mean of 24 hours	Sea level, reduced to mean of 24 hours	Departure	Mean m mean mi	Departure	Maximum	Date	Mean max	Minimum	Date	Mean minimum	Greatest dally range	Mean wet t	Mean tem	Mean relative humidity	Total	Departure 1	Days with 0.01, or more	Total move	Prevailing tion	Miles per hour	Direction	Date	Clear days	Partly cloudy	Cloudy days	Average cloudiness,	Total snowfall	Snow, sleet, and ice on ground at end of month
Ohio Valley and Tennessee Chattanooga	Ft.	Ft.	Ft. 215	In.	In. 30.06	In.	°F. 56, 8	°F. -0.9	°F.		F. 9				F.		°F.	N 74	In. 3,86	In. +1.2		Miles								0-10 5, 5	-	In.
Knoxylle Memphis Nashville Lexington Louisville Evansville Indianapolis Terre Haute Cincinnati Columbus Dayton Elkins Parkersburg Pittsburgh	762 995 399 546 989 525 431 822 575 627 822 899 1, 947 637 842	216 137 59	97 86 191 230 234 116 230 129	28. 99 29. 60 29. 46 28. 98 29. 45 29. 56 29. 11	30. 06 30. 04 30. 02 30. 05 30. 05 30. 03 30. 03 30. 00 30. 02 30. 01 30. 00 30. 05 30. 05	05 05 02 03 05 05 07 06 07	59. 2 61. 6 58. 6 56. 2 57. 4 57. 5 54. 6 55. 6 55. 6 55. 9 56. 9 55. 5	-0.7 -1.7 -2.4 -1.2 -1.9 -1.1 -0.6 -0.0 -0.4 +0.8 -0.2	80 82 80 77 80 78 78 78 78 78 78 78 78 78 78 78	20 3 24 23 3 24 24 24 3 3 2 3 3 3 3 3 3 3	70 70 69 65 67 66 64 64 64 64 64 64	38 35 42 36 34 36 35 32 30 33 35 34 27 34 37	7 7 7 12 6 30 30 30 30 30 30 30 30 29 22 31	50 49 53 48 48 49 46 46 46 46 46 47	32 31 29 33 29 30 26 29 28 33 30 31 42 36 31	53 52 54 52 50 51 48 48 49 48 48 45 48		74 77 72 76 73 74 70 73 74 72 72 72 83 73 68	7. 89 5. 34 3. 06 4. 94 2. 28 3. 05 4. 85 3. 25 3. 20 3. 28 3. 99 3. 62 3. 87 2. 46 2. 79	+0.4 +2.6 +0.6 +0.8 +1.6 +1.6 +1.6 +1.6 +1.6 +1.6	7 9 7 11 9 8 8 8 11 8 13 12 12	8, 545 7, 516 5, 651 8, 812 7, 070 4, 413	ne. s. nw. s. s. s. s. s. s. s.	26 277 25 411 35 30 28 35 30 24 37 27 37 34 32	s. nw. se. w. n. nw. w. w. w.	26 26 4 26 27 10 10 29 27 27 27 29 17 27	14 16 15 14 18 13 14 8 10 10 8 9 6 8 5	6 4 5 4 3 7 7 9 11 10 9 9 10 8 12	11 13 10 11 10 14 10 11 14 13 15	4. 4 4. 5 5. 1 4. 2 5. 0 4. 5 6. 3 5. 6 6. 2 6. 1 6. 7 6. 6	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	0.0 0.0 0.0 0.0 0.0
Lower Lake Region  Buffalo	836	10 74 71 86 68 130 267 8	61 100 85 102 79 166 337 67 87 84	29. 48 29. 06 29. 61 29. 42 29. 36 29. 21	29, 96 30, 00 29, 98 30, 00 30, 01 29, 98	07 05 05 07 08 07 07	49. 9 53. 6 54. 2 53. 8 54. 6 54. 8 55. 1 54. 4 53. 0 52. 8	+1.7 +2.7 +2.8 +3.0 +2.3 +3.6 +1.4 +1.5 +0.1 -0.4 +0.4	76 77 78 80 79 81 78 79 80 77 76 75	3	60 59 62 61 62 62 62 62 63 60 61 60	34 29 32 35 35 36 36 34 37 33 34	31 13 14 31 14 31 14 14 14 14 13 13	47 41 45 47 46 47 48 48 46 45 45 45	31 29 33 28 29 29 27 31 35 31 29 25	48 47 48 47 49 48 47 47 48	43 44 42 45 42	74 74 73 71 74 68 75 77 76	4. 12 3. 26 5. 57 4. 75 4. 34 3. 08 5. 38 2. 69 3. 06 4. 31 4. 68 4. 59 3. 78	0.0 +2.5 +1.5 +1.1 +0.6 +2.6 +1.6 +1.6	15 14 13 15 12 14 16 13 12 17 13 11	11, 733 11, 516 7, 465 7, 481	SW. 8. SW. 8. 8. S. SW. SW. SW.	59 31 33 31 30 25 41 43 27 30 32 32	8W. 88. W. W. 8W. 80. W. 8W.	11 11 4 12 12 29 31 12 29 29 29 29	4	10 8 7 8 12 9 6 5 10 9 10	19 22 21 17 19 18 21 17 15	7. 5 7. 9 8. 1 7. 8 7. 4 6. 8 7. 3 7. 4 6. 3 6. 6	T. T. O.	0.0
Alpena Escanaba Grand Haven. Grand Rapids Houghton Lansing Ludington Marquette Port Huron. Sault Sainte Marie Chicago Green Bay Milwaukee Duluth North Dakota	632 707 668 878 637 734 638 614 673 617 681	54 54 70 64 60 77 79 111 7	89 244 99 88 66 111 120 52 131	29. 28 29. 26 29. 17 29. 20 29. 01 29. 24 29. 14 29. 25 29. 25 29. 24 20. 28	29. 96 29. 94	05 09 10 06 07 09 06 07	47. 2 44. 9 50. 4 51. 6 43. 3 50. 0 48. 6 45. 0 51. 5 45. 1	+0.1 -1.1 +0.3 +0.4 -0.3 -1.1 -1.7 +1.0 +0.5 -1.4 -1.5 -1.2 -2.7	76 79 70 77 67 74 72 77 74 74 80 81 78	1 1 2 19 1 2 1 1 1 2 1 1 1 1 1 1 1	55 52 57 59 49 58 55 52 59 51 60 55 57 49	33	6 11 31 31 6 28 30 12 13 31 11 30 30 12	40 38 44 44 37 42 42 38 44 39 46 40 43 34	29 32 23 28 33 28 29 25 29 24 30 24 33	44 41 46 46 45 40 47 41 47 42 45 36	41 37 43 42 45 42 37 43 38 42 37 40 33	83 79 76 76 89 81 78 78 82 74 74 75 80	5. 31 1, 75 4. 29 4. 99 3. 96 4. 98 5. 14 1. 93 4. 29 5. 03 3. 52 1. 58 4. 85 1. 66	+2.6 +1.8 +2.2 +1.0 +2.8 +1.8 +1.8 +1.0 +2.8	14 14 15 13 17 16 16 20 12 17 11 13 13	7, 914 8, 954 9, 367 7, 168 7, 207 8, 413 7, 227 8, 661 6, 752 8, 576	ne. sw. w. sw. e. sw. se. sw. sw.	30 32 37 35 33 25 31 31 30 33 28 32 32 32	nw. w. sw. ne. w. sw. w. u. u. u. u.	29 29 11 1 28 20 29 20 12 29 29 29 29 29 29	4 4 3 3 3 3 7 1 3 3 3 7 4 6 6	111 5 8 5 6 7 7 3 11 11 8 4 8 2	22 20 23 22 21 17 27 17	7. 3	0.3 10.0 T. T. 2.1 T. 0.8	0.0 0.0 0.2 1.0 0.0 0.0 0.2 0.0 0.2
	940 1, 674 1, 478 1, 457 833 1, 878	12	67	28. 94 28. 18 28. 39 28. 38 28. 01	29, 97 30, 00 29, 99 29, 97 30, 03		40.4	-3.3 -4.7 -5.7	83 74 80 73	2 1 1 2 2 1	50 49 45 52 49 47	15	9	33 31 29 31 32 30	33 42 40 44 37 45	37 35 33 34 34		75 74 81 76	1. 37 2. 05 2. 88 0. 78 2. 74 2. 11	-0.3 +1.1 +1.6	9 8 12 7 8	9, 715	nw.	24 31 29 44 36 26	nw. nw. nw.	28 28 24 28 29 19	4 7 4	7 7 8 10 11 7	18 16 19 14 16 16	7. 0 6. 4 7. 6	3.6	0.0
Upper Mississippi Valley Minneapolis St. Paul La Crosse Madison Waussau Charles City Davenport Des Moines Dubuque Keokuk Cairo Peoria Springfield, III Hannibal St. Louis Missouri Valley	837 714 974 1, 247 1, 015 606 861 700 614 358	114 111 70 4 10 118 5 81 64 87 11 5	149 48 78 62 51 143	28, 95 29, 04 29, 18 28, 91 28, 90 29, 32 29, 32 29, 32 29, 33 29, 33 29, 39 29, 42 29, 39	29. 94 29. 95 29. 96 29. 96 29. 99 29. 98 29. 98 29. 97 30. 00 30. 02 30. 02 29. 98 29. 99	06 06 07 08 05 05 05 05 07 06 07	46. 4 46. 4 46. 9 48. 0 43. 5 46. 6 51. 4 50. 3 48. 8 53. 2 58. 2 52. 8	-2.2 -3.4 -2.3 -2.0 -2.3 -3.1 -3.1 -2.2 -2.2 +0.8 -1.3 -0.9	80 83 81 78 80 82 81 85 80 82 82 82 82 82 82 82	1 1 1 2 1 1 1 2 2 2 2 2 19 2 2 2 19 19 19	54 55 55 55 55 57 60 61 57 63 66 66 65 67	29 29 26 30 24 25 30 26 31 30 38 25 29 30 35	31 13 12 30 30 30 30 30 30 30 30 30 30 30 30 30	38 38 38 40 34 36 42 40 40 43 49 42 45 44 48	28 31 42 26 35 44 31 45 32 33 29 34 35 29	42 43 40 45 44 43 46 51 46 48		73 77 76 74 71 74 69 75 76 73 66	2. 28 0. 89 1. 08 0. 74 3. 68 1. 10 1. 09 2. 96 3. 56 3. 18 3. 70 1. 90 4. 28	-1.2 -1.1 -1.6 +1.2 -1.3 -0.3 +0.7 +0.8 +0.9 +1.2 -1.3	10 9 9 13 14 11 8 9 6 9 8 7	6, 867 4, 204 7, 120 5, 219 5, 472	s. nw. w. nw. nw. sw. s. s. s.	32 28 21 26 22 24 37 33 24 31 23 24 32 27 32	nw. w. nw. nw. nw. nw. nw. nw. nw.	29 19 29 29 20 29 29 28 29 28 10 29 28 28 28 28	5 6 5 4 3 9 7 7 7 15 13 15 11 14 20	6 6 4 6 2 6 10 12 2 5 8 4 8 7	20 19 22 21 26 16 14 12 22 11 10 12 12 10 7	6. 2 7. 4 7. 1 7. 5 7. 5 8. 5 6. 5 6. 3 6. 0 7. 3 4. 9 4. 8 5. 2 4. 8 3. 6		0.0 0.0 1.0 0.0 0.0 0.0
Columbia, Mo Kansas City St. Joseph Springfield, Mo Iola Iola Topeka Lincoln Omaha Valentine Sioux City Huron Pierre Yankton	784 963 967 1, 324 987 1, 105 2, 598 1, 135 1, 306 1, 572 1, 233		84 86 49 104 50 107 81 122 54 164 74 75 57	29, 16 28, 97 28, 95 28, 61 28, 95 28, 71 28, 81 27, 30 28, 75 28, 58 28, 32 28, 66	30, 00 30, 01 30, 00 30, 01 29, 99 30, 00 30, 05 29, 98 30, 00 30, 00 29, 99	05 03 04 03 04 01 01 02	55. 2	-1.4	81	2 14 2 18 18 18 2 2 2 2 1 16 2	66 65 64 68 72 66 64 63 57 60 56 56 60	31 33 29 34 28 32 30 29 17 28 19 21 29	6 30 31 26 26 26 30 30 29 30 31 31 31	44 47 43 46 45 44 41 42 32 39 34 35 38	39 37 31 40 39 42 39 43 39 45 46 43	47 45 47 44 44 37 42 38 38	38 37 31 34 32 32	64 67 61 65 63 70 62 68 67	2. 36 2. 43 1. 22 4. 86 1. 38 1. 00 1. 58 1. 36 1. 55 0. 95 0. 64 1. 25 0. 86	-0.2 -0.5 -1.5 +1.8 -1.6 -1.4 -0.3 -0.8 +0.4	57766676674888	6, 852 7, 399 7, 475 7, 798	sw. sw. s. s. s. nw. w. nw. nw.	37 31 28 27 35 32 40	n. nw. nw. nw. nw. nw.	28 28 28 28 28 28 28 28 28 28 28 28 28	17 16 17 20 14 16 13 14 10 10 10 9	7 5 3 10	7	4.0 4.2 3.4	T. 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

TABLE 1 .- Climatological data for Weather Bureau stations, October, 1932-Continued

	Elev	ume	ents		Pressur	e	120	Ter	nper	atu	re of	the	air			ter	of the	dity	Prec	ipitati	on	1	V	Vind		7 1				tenths		ice on
District and station	above	neter	neter	educed of 24	educed of 24	from	ax. +	from			mnm			num	dans	wet thermometer	temperature dew point	ve humidity		from	0.01, or	ment	direc-		aximi relocit			dy days	ē2			leet, and i
	Barometer above sea level	Thermon above gro	A nemom above gro	Station, reduced to mean of 24 hours	Sea level, re to mean hours	Departure	Mean ma mean min.	Departure f	Maximum	Date	Mean maximum	Minimum	Date	Mean minimum Greatest dail	Greatest daily	Mean wet t	Mean temp	Mean relative	Total	Departure normal	Days with 0.01,	Total movement	Prevailing tion	Miles per	Direction	Date	Clear days	Partly cloudy	Cloudy days	Average cloudiness,	Total snowfall	Snow, sleet
Northern Slope	Ft.	Ft.	Ft.		In.	In.	°F. 42,4	°F. -2.8			F.					°F.	°F.	N 66	In. 1,41	In. +0, 4		Miles								0-10 5.6	In.	In
illings avre letena. alispell files City aspid City heyenne. ander heridan ellowstone Park forth Platte.  Middle Slope	3, 140 2, 505 4, 124 2, 973 2, 371 3, 259 6, 088 5, 372 3, 790 6, 241 2, 821	5 11 89 48 48 50 84 60 10 11	113 56 55	25. 84 27. 00 27. 51 26. 61	30, 05 30, 08 30, 09 30, 10 30, 07 30, 02 30, 09 30, 10 30, 15 30, 02	+0.07 +.05 +.08 +.10 +.06 +.01 +.05 +.13		-1. 7 -1. 3 -4. 5 -5. 3 -1. 9 -2. 1 -5. 5 -1. 3	79 71 88	5	58 53 53 51 52 54 55 55 54 47 62	12 17 16 12 13 13 15 5 4 12 20	31 10 9 9 20 10 25 20 31 30 29	30 32 34 33 32 30 28 26 25 35	50 44 41 38 41 40 43 45 51 41 50	36 37 38 36 36 34 33 33 29 38	30 30 34 31 30 25 26 28 23 31	68 61 74 71 65 56 64 74 63 58	2. 10 0. 66 0. 85 1. 35 2. 32 1. 22 0. 41 2. 02 3. 27 1. 01 1. 03	-0.6 +0.7 +2.2 -0.4 0.0	6 14 11 9 7 6 12 13 6	4, 392 5, 089 6, 556 9, 329 3, 753 4, 393	nw. sw. sw. nw. s. n. w. sw. nw. sw.	32 30 25 29 38 51 29 27 29 32	sw. ne. nw. nw. w. s. nw.	14 25 27 28 28 23 16 28 27 28	3	12 15 8 12 9 7 9 12 12	15 14 20	7. 1 7. 5 6. 2 5. 5 3. 7 4. 3 5. 0	23. 3 17. 6	0. 0. 0. 0. 0. 0. 0. 2. 1.
enver	5, 292 4, 685 1, 392 2, 509 1, 358 1, 214	106 80 50 10 85 10	86 58 86	28, 55 27, 41 28, 56	30.00 30.03 30.02	+.01 .00 .00 03	48. 6 52. 0 53. 6 54. 5 56. 8 60. 4	-2.6 0.0 -2.3 -1.6 -1.8 -1.1	82 84 85 88	7	67 65 69	16 26 29 27 34 35	29	36 37 42 40 45 48	39 45 40 42 37 38	38 40 45 43 46 49	27 28 38 36 38 42	52 49 66 61 56 61	0. 99 0. 54 2. 43 0. 71 0. 40 1. 89	-0.1 -0.1 +0.5 -0.6 -2.2 -1.0	5 4 6 4 5 4	5, 681 5, 000 6, 407 9, 088 8, 238 7, 506	SW.	32 30 26 32 32 32	nw. ne. sw.	28 22 18 3 7 3	17 15 18 24 17 21	14	1 5	3.8 3.7 3.3 2.1 3.6 2.7	T. T. 0.0	0.
Southern Slope bilene	1, 738 3, 676 2, 537 944 3, 566	10 10 5 64 75	52 49 62 71 85	28, 21 26, 28 27, 40 28, 98 26, 40	30. 02 30. 00 30. 03 29. 97 30. 00	+. 01 . 00 01 +. 04	58. 3 60. 4	+0.6 -3.2 -2.9	86 87 87 85	18 17 17 17 17	75 72 73 77 69	36 32 32 41 29	29 26 26	50 45 48 56 44	35 39 38 30 42	52 46 50 59 48	46 37 46 55 42	66 64 58 70 73 67 56	0. 34 0. 64 0. 51 0. 12 0. 57	-1.0	5 4 7 4 5	6, 967 6, 749 6, 261 5, 151	S. SW. S. SO.	32	n. n. nw. ne.	3 3 25 3	17	8 6 7	6 5 8 9 4	3, 2	0. 0 T. 0. 0 0. 0 T.	0 0
l Paso llouquerque anta Fe lagstaff hoenix uma dependence	3, 778 4, 972 7, 013 6, 907 1, 108 141 3, 957	152 51 38 10 10 9 6	175 66 53 59 107 54 27	20. 72	29, 95 29, 99 29, 94	+. 03 +. 02 01	62.6 54.0 47.4 46.8 71.5	-0.9 -3.0 +2.1 +0.9	84 80 73 74 96	14 3 14 4 4	74 68 60 62 86 87 75	20	26 26 25 19 19 26 20	51 40 35 32 58 59 44	36 38 35 41 38 38 40	51 43 38 37 56 59 43	44 34 31 45 50	58 56 60 62 46 53	0. 53 1. 46	-0.3 -0.2 +1.3 +3.1	7 9 8 5		ne. e. nw.	43 26 19 30 34 31	e. sw. sw. n.	18 20 9 17 8 24	16 16 17 23	10 8 9 6 4	5 7 5 2 2 0	2.9 3.6 4.0	0.4 3.0 T. 0.0	00000
Middle Plateau ieno	4, 532 6, 090 4, 344 5, 473 4, 360 4, 602	74 12 18 10 163 60	81 20 56 46 203 68	25 70	30. 05 30. 12 29. 99 30. 05 29. 99	+ 07	53. 6 48. 0 48. 6 51. 1 52. 0	+2.9 -0.3 +0.6 -1.4 -0.8	84 79 84 78 78	5 4 5 15 6 2	65 67 64 61	28	25	36 42 29 33 41 38	44 29 50 46 31 37	40 39 36 37 41 39	27 24 23 24 29 27	43 42 36 46 46 45 45	0. 09 T. 0. 06 0. 29 1. 06 0. 17	-0.6 -0.4 -0.4 -0.8	1 0 1 2 3 3		nw.	30 29	sw. nw.	22	26 24 22 19 20	5 7		2.8	T. T. T. T.	00000
akeroliseewistonocatellopokanevalla WallaakimaNorth Pacific Coast	3, 471 2, 739 757 4, 477 1, 929 991 1, 076	48 79 40 60 101 57 58	68 110 65	27. 25 29. 29 25. 54 28. 03 29. 01	30. 11 30. 08 30. 10	+. 07 +. 04 +. 04 +. 01	52, 6	+0.8 -0.2 +2.5 -1.3 +0.9 +2.4 +2.4	82 86 80 81 84 89	1 1 2 1 2 2 2	63	25 25 30 17 28 37 25	24 24 24	35 38 43 35 40 47 41	41 34 40 40 39 30 38	39 42 37 43 47 45	32 33 26 35 37 37	60 55 47 64 54 60	0. 52 0. 40 1. 17 0. 09 1. 14 1. 48 0. 41	-0.8 -0.1 -1.1 0.0 0.0 -0.2	6 7 10 3 8 8 6	4, 640 3, 802 2, 669 6, 433 4, 609 4, 115 3, 659	se. nw. e. se. s. s. nw.	21	SW. nw. nw. sw. sw. w.	14 18 27 22 27 13 27	8 16 7	8 9 6 9 9 6 10	11 7 17 6 15 14 13	5.5 4.8 4.2 6.8 4.3 6.5 5.8 6.2	0.3 T. 0.0 0.0 0.0 0.0 T.	0000
Region  North Head  Port Angeles eattle acoma atoosh Island dedford ortland, Oreg acoeburg	211 29 125 194 86 1, 329 153 510	215 172 9 29 68	53		30, 11 30, 10 30, 08 30, 10 30, 10 30, 11 5 30, 11 7 30, 13		50.6	+0.1	85 74	3 4 4 3 4 3 4	57 58 60 60 55 71 64 67	43 35 40 37 45 27 40 36	28 30 30 28 29 24 28 24	49 44 48 47 48 40 50 44	38 25 24 27 27 47 28 44	51 50 49 47 52 50	47	77 87 64	3. 74 5. 58 2. 06 3. 10 4. 77 8. 31 0. 70 3. 76 1. 67	+0.6 -0.3 +0.3 +1.4 +0.2 -0.6 +0.6	18 15 17 15 2 21 6 6	3, 599 5, 747 5, 508 9, 473 3, 420	s. se. s. e. s. nw.	45 18 35 32 50 28 21 18	SW. S. SW. SW.	29 27 27 27 27 14 5 31 13	4 3 2 6 13 3	10	17		0.0	
Middle Pacific Coast Region  ureka ded Bluff scramento an Francisco an Jose South Pacific Coast	62 330 69 155 141	100	58	29. 6	30.01	.00	52, 6 66, 4 64, 1 62, 2 61, 2	+2.1 +1.2 +1.3 +0.6	97 97 90 80 83	14 2 5 27 10	58 80 78 69 74	41 42 44 51 39	24 21 21 12 31	47 52 50 55 49	21 42 36 25 41	51 52 54 54	49 38 44 48	41 54 70	0. 28 1. 32 0. 06 0. 00 0. 01 T.	-1.0 -1.3 -0.9 -1.1 -0.7	2 2 2	6,074	nw. nw. w.	23 21 26 26 22	nw.	24 19 17 24 24	13 9 20 7 29 1 16 1 15	N O	111 2 0 7 4	2.4 0.7 3.8 3.2	0. 0 0. 0 0. 0	0 0
Region resnoos Angelesan Diego	338	159	98 191 70	29. 60 29. 80 29. 80	29, 96 29, 96 29, 94	+. 02 +. 01 01	65. 5 66. 1 67. 2 63. 2	1	97	5 11 26	81 76 70	42 53 50	24 31 28	51 59 57	36 28 25	52 56 57	40 47 52	45 60 74	0. 39 0. 00 0. 08 1. 10	-0.6 -0.6	8 2	4, 405 2 3, 967 4, 340	SW.	18	nw.	17	7 16	8 3 6 11 1 11	1 4	3.2 1.0 3.5 5.2	1	0000
West Indies an Juan, P. R Panama Canal	82	8	54	29.8	29.89		80. 8	+1.0	90	20	86	72	29	76	15				7. 45	+1.6	6 2	6, 115	ne.	30	ne.	31		6 20	5	5. 5	0.0	0
alboa Heights ristobal			97		1 29, 82 1 29, 82	.00	79. 4 81. 5	+0. +1.	90 91	5 7	85 88	71 74	22 22	74 76	15 16		74	1 87	11. 60 16. 78	+1. +1.	2 2	4, 513 4, 352	s. se.	25	sw.		0 0	0 11 12	2 18	7.9 8 7.5	0.6	
airbanks	455 80	11			2 29. 77 2 29. 88		28. 8 44. 2		57	9	36 48	-6 31	31 27	21 40	25 19	43	40	70 86			1 0	3, 478 5, 534			ne. 0 se.	14	9	3 8	8 20	8.6	6.3 T.	2

<sup>1</sup> Observations taken bihourly.

Pressure not reduced to mean of 24 hours.

# Table 2.—Data furnished by the Canadian Meterological Service, October, 1932

(Compiled by Annie E. Small)

	Altitude		Pressure		Ome 7	Tem	perature of	the air			1	Precipitatio	n
Stations	above mean sea level, Jan. 1, 1919	Station reduced to mean of 24 hours	Sea level reduced to mean of 24 hours	Depar- ture from normal	Mean max. + mean min. +2	Depar- ture from normal	Mean maxi- mum	Mean mini- mum	Highest	Lowest	Total	Depar- ture from normal	Total snowfall
7/1	Feet	In.	In.	In.	• F.	• F.	° F.	° F.	• F.	° F. 24	In.	In.	In.
Cape Race, N. F. Sydney, C. B. I. Halifax, N. S. Yarmouth, N. S. Charlottetown, P. E. I.	99 48							38.9		24	2.77	*********	0.0
Halifax, N. SYarmouth, N. S	88 65												
Charlottetown, P. E. I								~~~~~					
Chatham, N. B	28 20 206 1,236	29. 90	29.92	-0.03	43.7	-1-3.9	50.6	36.9	74	20	2.87	-0.03	1.
Quebec, Que	296	29. 64	29, 92 29, 96	04	46. 0 38. 3	+3.9 +3.6	52. 2 46. 9	36. 9 39. 9 29. 7	74 76 65	25 -2	2. 50 9. 18	-0.56	1.0
Father Point, QueQuebec, Que	1, 236	29.75	29.96	05	49.2	+4.4	56.0	42.4	76	30	6. 13	+8.00	T.
		29.70	29.96	05	48.9	+5.1	58.0	39.8	78	26	4, 40	+1.85 +1.16	0.0
Ottawa, Ont	285	29. 66 29. 56	29.97 29.97	06 07	51. 5 51. 4	+5.1 +4.5 +4.8	58.3 58.6	44.8 44.1	72 73	30 33	3.89 1.82	+1.16 -0.54	T. 0.8
Cochrane, Ont	930	28.60	29, 94	-, 04	37, 0 35, 4	-1.7	43.5	30, 6 26, 7	68 70	14 8	5, 33 2, 89	+0.54	15.0
					49, 2		57.5	41.0	72	24	3, 21		T.
London, Ont	656	29, 22 29, 23	29.94 29.93	08 08	49.6 47.8	+3.5 +3.9	57. 2 54. 4	42.1 41.2	72 69	30 30	4. 27 6. 07	+1, 10 +2, 15	T.
Port Arthur, Ont	644	29. 24 29. 16	29.95 30.01	03	40.9	+1.0	47.6	34.2	73	18	2. 19	-0.37	3.
		-	1400	+.03	36.9	-2.2	44.1	29.7	67	12	2.06	+0.36	1.0
Minnedosa, ManLe Pas, Man	1, 690 860 2, 115	28. 15	30.00	+.03	33. 8 31. 4	-4.0	42. 2 38. 8	25. 5 24. 0	72 67	9 12	1.98 1.18	+0.78	14.
Le Pas, ManQu'Appelle, Sask	2, 115	27. 69	29.98	+.01	33. 2 35. 5	-6.2	42.3 45.1	24.1 25.9	78 80	-2 -1	1.13 1.07	+0.03	8.
Swift Current, Sask	1, 759 2, 392	27. 41	29.97	.00	38. 4	-3.7	49. 4	25. 9 27. 4	77	6	0.72	-0.16	5.
Medicine Hat, Alb	2, 365									***********			
Calgary, AlbBanff, Alb	2, 365 3, 540 4, 521												
Banff, AlbPrince Albert, Sask	1,450	28. 43 28. 26	30, 03 30, 04	+. 06 +. 07	33.9 34.6	-3.2 -5.0	42.0 45.1	25. 9 24. 0	73 76	10	1.04 0.50	+0.21 +0.05	4.
Edmonton, Alb		1	00.02	1		0.0					0.00	10.00	
Kamloops, B. C.	2, 150 1, 262 230 4, 180									**********			
Kamloops, B. C	4, 180	29. 83	30.09	+.08	52.1	+2.9	57. 2	47. 1	76	40	2. 34	-0.03	0.0
Estevan Point, B. C	20												
Prince Rupert, B. C	170												
Hamilton, Der	101												
	1	L	ATE RE	PORTS	FOR S	EPTEM	BER, 19	32					
Cape Race, N. F	99												
Halifax, N. S.	48 88	29. 97 29. 90	30. 02 30. 00	+0.01 04 09	58. 4 59. 7	+1.9	66. 6 67. 4	50. 2 52. 0	81 80	34 38	12.34 5.37	+8.96 +1.06	0.
Cape Race, N. F. Sydney, C. B. I. Halifax, N. S. Yarmouth, N. S. Charlottetown, P. E. I. Chatham, N. B. Father Point, Que	88 65 38 28	29. 89 29. 93	29. 96 29. 97	09 04	59. 2 59. 7	+1.9 +2.1 +3.1 +2.4 +2.1	66. 6 66. 2	51.9 53.2	83 77	39 42	2.86 2.23	-0.75	0.
Chatham, N. B.	28	29. 90	29. 93	04 07	57.5	+2.1	67. 6	47.5	83	33	2.61	-1.17 -0.10	0.
Quebec, Que	296												**********
Doucet, Que	1, 236												

# SEVERE LOCAL STORMS, OCTOBER, 1932

(Compiled by Mary O. Souder)

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path (yards)	Loss of life	Value of property destroyed	Character of storm	Remarks		A	uthority	
Fontana, Calif	1	4 p. m	13			Hailstorm	Auto tops and roofs damaged; poultry killed	Official,	U.	S. Weather	Bu-
Canton, N. Y	2	1 a. m				Electrical	Barn destroyed	Do.			
Fayetteville, Ark	3				\$1,500	do		Do.			
Pine Bluff, Ark. (7 miles north).	4	2:30 a. m	880		3, 000	Tornado	Property damaged	Do.			
Eureka, Calif	5					Electrical	2 houses struck by lightning; several thousand dollars damage.	Do.			
Myrtle Beach, S. C	5				25,000	Thunderstorm	Dwelling burned after being struck by lightning.	Do.			
Eastern Delaware Coun- ty, N. Y.	5-6				125, 000	Heavy rain and flood.	No details	Do.			
Margarettsville, N. C., and vicinity.	5-6		50	1	35, 000	Tornadic winds	Church, store, and a dozen houses destroyed; corn shocks torn up; path torn out in woods; number of persons injured.	Do.			
Southampton County,	6			1	7, 500	do	Damage to buildings	Do.			
Eastern shore of Lake Okeechobee, Fla.	7	P. m				Heavy rain	Crop loss on 10,000 acres; 40 square miles under water.	Do.			
Phoenix, Ariz	8	A. m				Electrical, rain, and wind.	Electric wires and property damaged; streets flooded.	Do.			
Yuma, Ariz., north of	9-10				6,000	Heavy rain		Do.			
Brewerton (near), N. Y.	10-11				60, 000 70, 000	Gale	Power lines disabled; property damaged; con- siderable loss in apple crop; 3 barges loaded with grain, bound from Buffalo to Albany, sunk.	Do.			
New Haven, Conn., and vicinity.	10-11				1,000,000	Gale and storm		Do.			
Pensacola (near), Fla	15	1:18 p. m			30,000	Gale		Do.			
Valentine, Nebr	17-18					Glazestorm	No details	Do.			
Sheridan, Wyo	17-18	10:25 p. m.		2		Snowstorm	Much damage to trees	Do.			
Wichita, Kans	18	10:25 p. m.		1	200	Wind	No other details	Do.			
Bismarck, N. Dak	18-19	***********				Snow, sleet, and rain.	Telephone and telegraph communication inter- rupted; roads in northern and western parts of the State blocked by snow.	Do.			
Devils Lake, N. Dak	18-19					Icestorm	Much damage to all wire systems	Do.			
Casper, Laramie, Lusk, Riverton, Dubois, Cheyenne, Rock Riv- er, and Green River, Wyo.	18, 19, and 21				***********	Glazestorms	Considerable damage to telephone lines	Do.			
Meridian, Miss., and vicinity.	22		1			Heavy thunder- storm.	2 persons injured by lightning	Do.			
Oklahoma City, Okla	25	5 a. m			20, 000	Electrical	10 oil tanks destroyed	Do.			
Williamsport to Lock Haven, Pa.	26	P. m				Strong winds	Damage to wires	Do.			
Bayfield Peninsula, Wis., to Calumet, Mich.	28-29	P. m			22,000	Heavy snow and gale.	Highways blocked, auto stalled, electric wires damaged; city dock at Ashland wrecked.	Do.			
Dallas, Tex	31	3:50 to 6:00				Thundersquall	Damage reported as result of high winds	Do.			
Cowarts, Ala	31	11:30 a. m.	350	1	32, 000	Tornado	16 persons injured; property damaged; path 4 miles long.	Do.			
Grady County, Ga	31	3:00 p. m	100		40,000	do		Do.			
Gulfport, Miss. (3 miles east of).	31	3:10 p. m				Thundersquall		Do.			
Thomasville, Ga	31	5-8 p. m				Severe electrical, wind, and rain.	No material damage reported	Do.			
Fort Smith, Ark	<sub>d</sub> 31				15, 000	Electrical	Store building and stock damaged	Do.			

<sup>1</sup> Miles instead of yards.

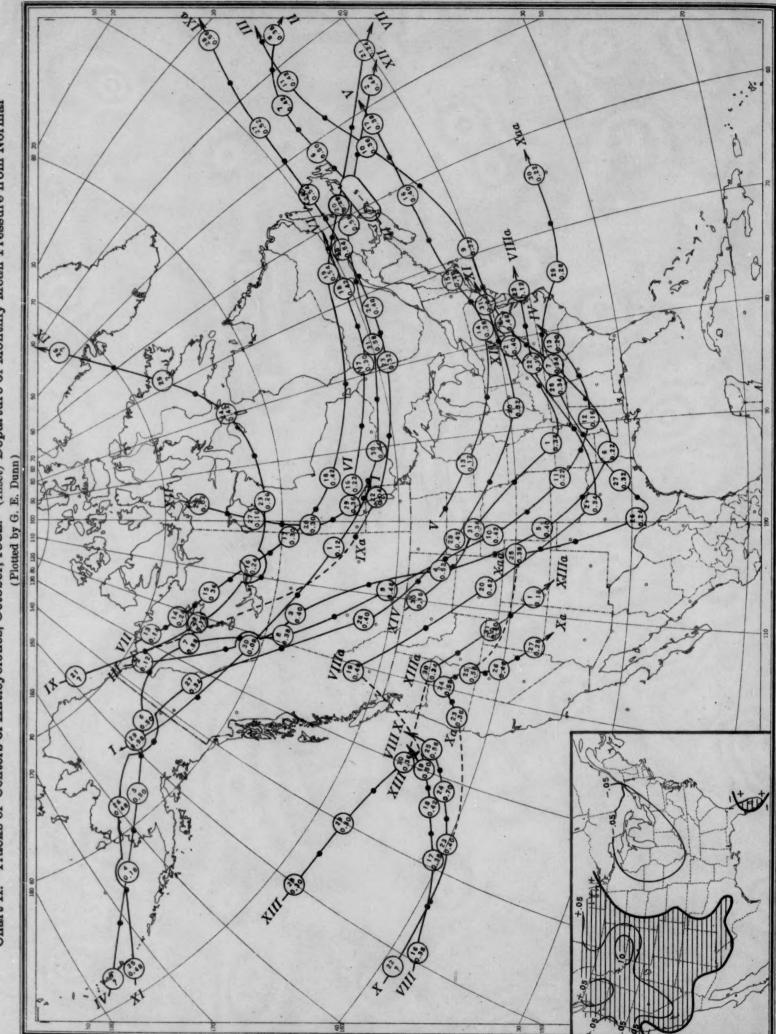
Chart I. Departure (°F.) of the Mean Temperature from the Normal, October, 1932

Shaded portions show excess (+).
Unshaded portions show deficiency (-).
Lines show amount of excess of deficiency.

no



(Inset) Departure of Monthly Mean Pressure from Normal Chart II. Tracks of Centers of Anticyclones, October, 1932.

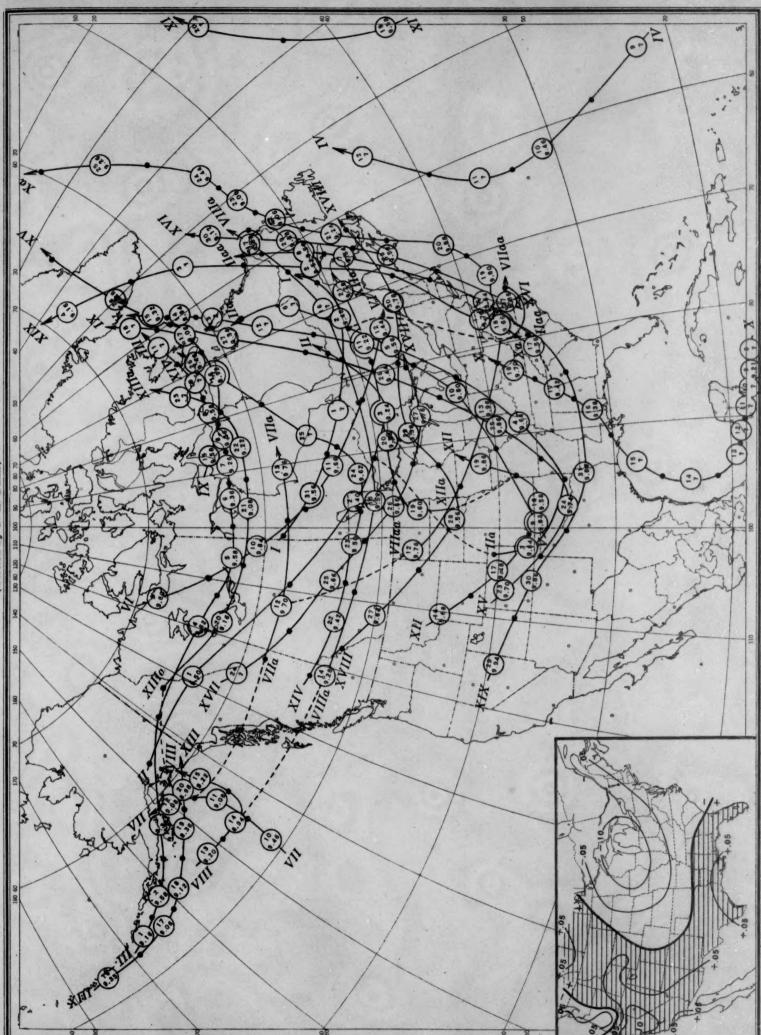


Dot indicates position of anticyclone at 8 p. m. (75th meridian time). Circle indicates position of anticyclone at 8 a. m. (75th meridian time), with barometric reading.

(Inset) Change in Mean Pressure from Preceding Month E. Dunn) (Plotted by G. Tracks of Centers of Cyclones, October, 1932. Chart III.

Dot indicates position of anticyclone at 8 p. m. (75th meridian time).

Circle indicates position of anticyclone at 8 a. m. (75th meridian time), with barometric reading.



Circle indicates position of cyclone at 8 a. m. (75th meridian time), with barometric reading.

(Inset) Departure of Precipitation from Normal

60 to 70 per cent. 50 to 60 per cent. Scale of Shades Chart IV. Percentage of Clear Sky between Sunrise and Sunset, October, 1932

Total Precipitation, Inches, October, 1932. (Inset) Departure of Precipitation from Normal

Ohart V.



Chart VI. Isobars at Sea level and Isotherms at Surface; Prevailing Winds, October, 1932

